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Wildlife IN NORTH CAROLINA

JANUARY, 1966

JOEL ARRINGTON

To the Point

Been quail hunting yet? If this photo doesn't make you want to go, nothing will. This is Snipe's Delivery Jim owned by Steve Robinson, Richmond, Va. The pointer is winner of the National Open Shooting Dog Championship and the National Amateur Shooting Dog Championship.

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WILDLIFE IN NORTH CAROLINA recognizes the need for close cooperation between State and Federal conservation agencies and the people who hunt and fish—to bring about a restoration of our renewable resources. The Editor gratefully receives for publication news items, articles, and photographs dealing with the North Carolina out-of-doors, but reserves the right to reject materials submitted. Full credit is given for all materials published.

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Wildlife IN NORTH CAROLINA

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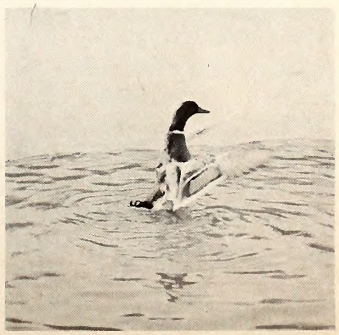
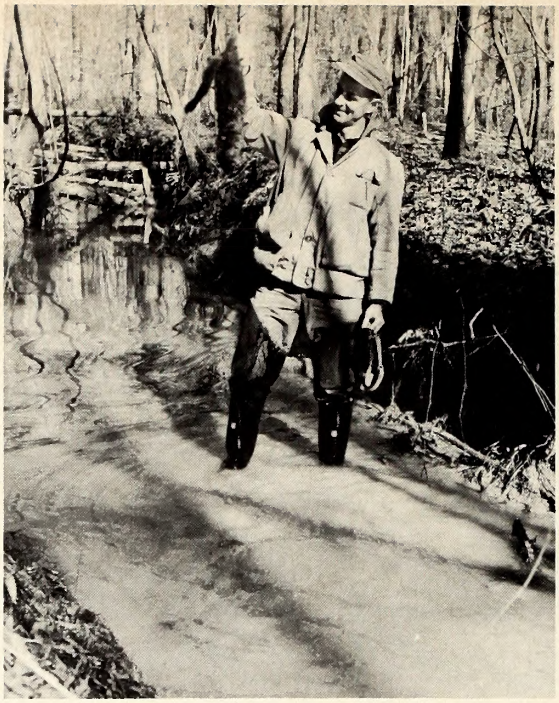


Most waterfowl hate to leave home, and this mallard drake is no exception. Even with ice closing around his pond, he manages a lusty stretch. If food is available most ducks will tolerate subfreezing temperatures and often wait until the very last minute to pile in from the north. Their body feathers form excellent insulation from the sharpest cold. Duck season closes January 8. Photo by Jack Dermid.

Think Like a Mink

by F. Eugene Hester
Photos by the Author



A large mink (left) is a catch of which any trapper can be proud. Success starts with a thorough knowledge of the mink's habits. Look for tracks like these above.

FOR a long, long time trapping has been a fascinating and profitable activity for outdoorsmen. It has provided a lot of adventure and recreation for those who have studied trapping long enough to learn about it.

Of all the animals which have challenged man's knowledge and skill, the mink is one of the best. Once a trapper has learned to outsmart a mink, he has opened the doorway to an entirely new type of outdoor experience. But learning to trap a mink is not so simple. It requires a knowledge of many things, but all of it can be summarized into one simple statement: A successful mink trapper must learn to think like a mink.

The mink is found in every county of North Carolina, but is never abundant. The mink is a great wanderer and travels long distances along its favorite streams, lakes and swamps. Mink are seldom seen, however, mainly because they are most active at night. In countless days and nights I have spent hunting, fishing and trapping, I have only seen two: one crossing a rural road at night with its nose close to the ground obviously trailing some small animal, and the other one running the shoreline of a mountain stream during the day.

For a long time the mink has been known as the gold nugget of the trap line. This nickname probably arose because of his small size and high value. In recent years most mink have sold for $5 to $10, but in former years they were even more valuable. Many factors have probably been involved in reducing the value, including changes in women's clothing fashions, production of new synthetic fibers, and the increase in mink farming.

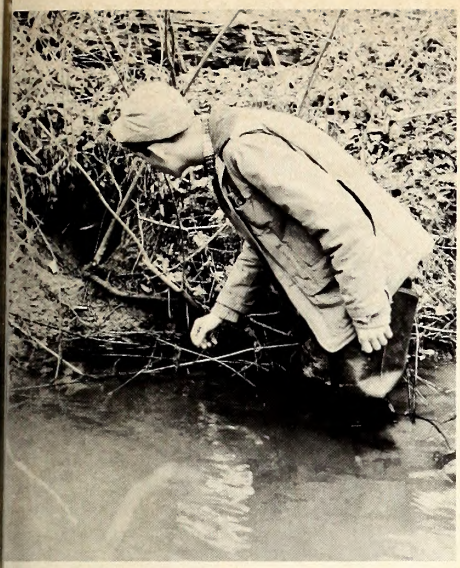
To learn to trap mink, you must learn the habits of the mink. Where do they live and what do they eat? You must also learn a lot about traps and how to use them.

Mink travel mainly along watercourses. They will run along small streams, rivers, lakes and swamps. A mink is equally at home on land or in the water. In small streams he may travel through shallow water, stepping on water-soaked leaves without leaving a trail. In swamps he may also leave very few signs when he runs along half sunken logs or walks across moss-covered stumps. Along rivers his tracks are likely to be more obvious. Here the fluctuating water level often exposes mud flats and sand bars on which his footprints may be found. It is important for a trapper to be able to detect these tracks. Other important signs, such as droppings and fur, will help locate good trapping places.

The mink is a carnivorous animal. His primary food items include crawfish, frogs, mice, small birds and fish. A mink is an effective predator equipped with needle-sharp claws and teeth, very much like those of a cat. Male mink are about twice as large as females. Males usually weigh 2 to 3 pounds, but females are not much larger than a squirrel and seldom weigh more than 1½ pounds. Mink in some sections of the state tend to be larger than those in other sections.

Most trappers would profit by learning to trap muskrats and other common furbearers before going after mink on any large scale. Mink are never very abundant, and this fact coupled with their wandering habits, makes the mink rather difficult to trap. The primary trick is to learn where the mink will step, and then set your trap there.

Although mink tracks are often found on riverbanks, this is generally a difficult place to effectively trap a mink. Fluctuating water level is probably the biggest difficulty. If you set your trap in the edge of the water today, you may find it six inches above or below water level tomorrow. A good trapsite should remain effective without moving



Study the stream banks carefully and select spots that mink are likely to frequent. A trapper will soon learn that caves like this make good sets.

Every detail must be checked in each mink set. This tunnel has been used by a mink. Always cover traps set under water with water-soaked leaves.

A knowledge of the traps and how to set them is essential also. Here a mink trapper adjusts the pan of a steel trap before setting it.

the trap until a mink is caught. This is necessary for two reasons: In its wandering, a mink will not visit the same spot each night, but might travel a long route such that it may be a week or two before he returns to the place he visited last night; also the trapsite will improve when it no longer has a disturbed appearance.

Most trappers use number 1 or 1½ traps for mink. Water sets are easier than dry land sets. The trap should be set in water 1 or 2 inches deep and covered with wet leaves from the stream bottom. Where possible, the trap should be staked in deep water so the mink will drown.

There are many effective sets which will catch mink, and the inexperienced trapper will be ahead if he sticks with standard sets until he masters them before attempting any new or fancy sets. There are four standard mink sets: the blind set, the barricade set, the spring run set, and the artificial tunnel set. These sets will catch mink if you learn to make them properly.

The blind set is one made by placing the trap where the mink is expected to step. This is usually in some passageway along the side of a stream. A space between a log and the bank might be a good example, or a passageway under an overhanging bank. Do not expect any well-worn trails, because mink do not travel the same routes every night. In fact, once a week is a good average. A blind set is the simplest, but at the same time it requires a lot of understanding of the habits of mink.

The barricade set is a modification of the blind set and is used in places where the path of travel is not narrowed by existing obstacles. A barricade is a barrier of sticks, brush or rocks which is placed in the mink's path to force him to go through a small passageway. This set guides the mink to your trap by preventing or discouraging him from taking an alternate route.

The spring run set is very effective. Mink look for food items in very small, shallow streams, including springs. If you can locate such a small, permanent stream, you will probably find that mink travel there. Such small streams are good places to trap since there is very little water fluctuation and, also, the trap will not freeze in cold weather in this flowing water.

The pocket set requires some effort for construction, but it is very effective when properly made. Mink often travel under overhanging banks, under tree roots, and in caves to find food and to look for den sites. They will go into nearly every cave they find. The pocket set is a small artificial cave, made by digging a hole into a streambank. The hole should be about 5 inches in diameter and should be dug straight back into the bank for about 12 inches, and then turned upward for a few inches. This hole can easily be dug with a small trowel. The trap should be placed in shallow water at the entrance to the tunnel.

Remember that a mink is not easy to catch and even experienced trappers seldom catch many mink unless they spend full time at it. Outsmarting a mink is an accomplishment of which a trapper can be proud. You may set a lot of traps and check them many times before you catch one, but if you are a true trapper, you will enjoy every minute of it. Remember, too, that the greatest value of trapping is recreation. It offers the same type of recreation as hunting and fishing.

To catch a mink you only need a few items: a trapper's license, a few traps, a lot of enthusiasm, and a knowledge of the mink and his habits. At first it may be slow, and you may work at it a long time before you get your first mink. The important thing is to stay with it—and learn to think like a mink.

This is reprinted from the May, 1965, "Sports Afield" magazine. Mr. Coleman heads up a well-known Wichita industrial firm.

JIM LEE

Youth Needs the Out-of-Doors

by Sheldon Coleman

YOU know, sometimes you have to wonder about intellectual America.

We spend billions building schools with the latest and best teaching equipment and then for 12 years cram science, mathematics, foreign languages and other academic subjects into our children's heads. Those who go on to college get four more years of much the same medicine and then are turned out into the world to make a living.

These young men and women are then supposed to be properly equipped to fill a niche in our competitive industrial society and to become a part of the vast team designed to keep the United States on top in the race for space and arms supremacy.

We do a good job in preparing the young men and women for this role in society, but we're overlooking one rather important thing—we forget to teach them what to do when they're not working.

We overlook the fact that they're probably going to work no more than 40 hours a week, perhaps as few as 30. In addition, most will have a long vacation sometime during the year. This means that they should have about 60 to 70 hours a week of leisure time—almost twice as much as the average person's working time. Yet we're doing very litle about teaching our sons and daughters how to use this time to keep themselves healthy and happy.

For too many people today, both young and adult, leisure time is a curse. So very, very many fail to find wholesome activities and hobbies that, to borrow a Boy Scout phrase, will keep them "physically strong, mentally awake and morally straight." And one of the chief reasons why so many today take to alcohol, have nervous breakdowns, wind up in mental hospitals and deteriorate morally is that they were never taught in school how to use their leisure hours in some kind of body-strengthening, mentally refreshing, wholesome form of recreation.

Oh sure, they had gymnastics in school; some learned to play football and basketball; but these aren't things you do after you get out of school. Did they get a chance to learn of the delights of camping, fishing, hunting, boating, outdoor photography, bird watching, nature study, hiking and the dozens of other things they could do the rest of their lives? These are the pursuits I believe can do most to keep America a nation of great people.

I have strong convictions about what the out-of-doors can do for the youth of our country, particularly in the sense of giving us happier, healthier kids who aren't likely to get into trouble with the law. What I have in mind are such attributes as physical fitness, emotional stability, moral respectability and good citizenship. Boiled down, these things merely mean a proper attitude toward life and toward the society in which the boy or girl lives—something, I'm afraid, a few millions lack these days.

I get the feeling sometimes that we have a tendency to avoid responsibility in these matters. If we worry about it at all, we decide that juvenile delinquency is a problem that should be solved by the schools, the churches, the police or the government, maybe. But I wonder whether we're not dead wrong in feeling this way, particularly when there's so much proof that we, and I am thinking especially of sportsmen and other outdoor-minded people, could do a lot to keep our youth from going astray.

Before I get into this matter of how sportsmen and others might fit into the picture, let me give you some background on how and why I became interested in this subject.

Maybe it all started a few

months back when I happened to walk into my personnel director's office. At the moment he was interviewing a young man who had applied for a job in our plant. I glanced at the boy, who looked as if he might be fresh out of high school, and saw what everyone sees too often these days.

The weather was warm, and he was dressed in a loud striped shirt. At least the top three or four buttons were open, so that quite a lot of his bare chest was exposed. His black pants were about two sizes too small around the hips and hung precariously low as if they were about to drop down. There was no belt, and his black shoes had very pointed toes, of course. And, as you would expect his hair was long.

One look, and I knew that this boy had hardly a ghost's chance of being hired. Practical businessmen know that this type is likely to be a troublemaker, all too often dishonest and irresponsible —the kind that can create more problems than a dozen ordinary employees.

Suddenly I was struck with a thought, and I asked the employment manager if he cared if I asked a few questions. He introduced us, and I went to work on this boy. He was suspicious and somewhat noncommittal, kept looking at the floor and slouched even lower in his chair. But I did find out a lot of things about him: he had never gone fishing, hunting or camping; his lack of knowledge about the out-of-doors was unbelievable, and his interests were just what you would have expected — automobiles, screech-and-howl music and roaming the streets at night. As I walked out of the office, I could only shake my head and feel sorry for the boy.

What a contrast, I thought, to the young man we had hired in the sales-promotion section just a few days before. Here was a boy, properly dressed, who stood straight and tall and looked you squarely in the eye when you talked to him. His background? You guessed it—he had been an Eagle Scout with all kinds of merit badges; he knew the outdoors like the back of his hand and had been camping, canoeing, fishing and living and playing outdoors ever since he was a youngster.

Of course, two isolated cases like this hardly prove that the out-of-doors builds men with character; but, believe me, there is plenty of other proof that this is true.

I discovered, for example, that there is positive evidence that real outdoor kids rarely get into serious difficulty with the law. Juvenile Court Judge William G. Long of Seattle heard 45,000 cases involving boys and girls over a 20-year period and discovered that not one of these had some wholesome outdoor hobby as his or her special interest.

J. Edgar Hoover, famed director of the Federal Bureau of Investigation, came up with just as startling a discovery. Case histories of the "most-wanted criminals" over the years revealed that fewer than one percent had ever been Boy Scouts. This is a tribute not only to scouting but to the outdoors as well. The inference is obvious—the outdoor training and experience received by Scouts keep them from deviating from the straight and narrow path and make them proud to be good citizens.

This character-building influence is not restricted to young people alone, either. J. J. Jones, a jailer of Knox County, Tennessee, examined the belongings of 10,000 inmates over a period of years and discovered that fewer than two percent had owned a hunting or fishing license when arrested.

Surely, statistics like these should make any responsible individual think. And I believe a lot can be done by the individual. I'm sure many parents and grandparents want to do something for the young people closest to them. And I like to think that an adult's responsibility and interest should not necessarily end with his own. Too many boys and girls today don't have parents who care or who have the time to be bothered. Individual effort can accomplish a lot in several different ways. I'm thinking of the father who resolves that he's going to make a "buddy" of his boy; takes him outdoors, camping and fishing, and teaches him the delights and benefits of outdoor recreation. Of the mother who sees that her son joins the Boy Scouts, where he will be taught how to live and play outdoors by dedicated Scout leaders. Of the "good neighbor" who takes a boy with him when he goes afield and of the man or woman who volunteers his or her time and talents to group training of young people in Boy Scouts, Girl Scouts, YMCA and YWCA, Red Cross and similar organizations.

What can these youngsters learn about conservation from a bird feeder? An appreciation of nature will make them better citizens tomorrow.

But to my mind, the real answer to this problem is to move the great outdoors into the nation's classrooms. Or, if you prefer, move the classrooms outdoors, occasionally. By doing this, I am convinced we would see a startling change in the incidence of juvenile delinquency, the lack of physical fitness and the growing prevalence of emotional disorders. In fact, I have decided in my own mind that such a move is imperative to the future of America and its people.

Let's digress just a moment and look at these projected benefits. What about this business of physical fitness? If you don't think it's bad, ask your son to do a half dozen push-ups. If he's on the football team, he'll be able to do it. If he isn't, chances are he'll be lucky to do one. In

fact, he probably won't even want to try.

I'm sure that people today, young and old, need more muscular conditioning. Our way of life works against physical fitness. Too many moderns ride to work or school, sit behind desks, operate machinery to do their labors for them and sit in front of television sets for their spare-time amusement. Those who develop a keen interest in some active form of outdoor recreation feel better and live longer than those who participate in sports only as spectators.

I'm positive, too, that the blessings of the out-of-doors are just as effective for keeping all ages on an even keel mentally. In this age of stress and strain, American people each year consume 11 million pounds of aspirin, 17 billion sleeping bills and so many tranquilizer pills that it's impossible to keep up with the changing figures, in an effort to ease their psychological problems. This hardly sounds as if we were living well-adjusted, carefree lives, does it? Doctors spend countless hours consulting with patients with nothing more seriously wrong than self-induced aches, pains and anguish.

The solitude of forest or stream, the relaxation of casting a fly over a trout, the honking of wild geese in the sky all serve as soothing sedatives to frayed nerves and weary minds. A noted Philadelphia physician, Dr. Raymond West, recently made the statement that he firmly believes that the United States could dispense with the services of 50,000 doctors if people would fully utilize the blessings found close to nature.

This simply means that persons who get outdoors regularly seldom become patients in mental hopsitals, seldom have nervous breakdowns or mental illnesses and are not often people who suffer with ulcers, insomnia or even bad dispositions. Does a man with a five-pound bass on the end of his line worry that his income tax is due? And whoever heard of a person who needed a pill to go to sleep after following a bird dog all day? What better tributes can we find for the stabilizing influence of the out-of-doors?

And while I'm at it, I might mention a sort of bonus benefit. The outdoors and the wonderful variety of recreation it has to offer can do a great deal for family togetherness, too. Families that play together in the wholesome atmosphere of wood and water stay together. This closeness brings a respect and understanding that can be credited with reducing juvenile delinquency and even the divorce rate.

Such an outdoor-education program as I sincerely propose for the country's schools could open up a whole new world for many young people. And as these young people develop an enthusiasm for the out-of-doors, it could mark the beginning of a benign cycle. Suddenly, they would become aware of the need for clean waters, green forests, the protection of wildlife and the preservation of the nation's soils. They would become conservation-conscious and willing to fight for the things upon which their "good life" depended through the remainder of their lives.

We need to act and act fast as the demand for outdoor recreation grows by leaps and bounds. Clean water is perhaps one of the most pressing of the various conservation problems, because about 60 percent of all outdoor recreation is waterbased, and polluted water has little to offer for this purpose.

The loss of streams and lakes has been staggering in the past half century. Industrial wastes, sewage from towns and cities and mine seepage have ruined fishing, camping, boating, picnicking and other activities along thousands of miles of streams and lakes. In many sections, economically depressed areas are contiguous with regions of heavily polluted waters. The recreational industry, the number one source of income in many regions, has been almost completely eliminated by defiled streams, lakes and bays.

It's extremely important that we strengthen present legislation to encourage cities and towns to build adequate sewage-disposal installations. Through federal and state action, we need to inaugurate a program of restoration for streams already lost to pollution.

We need, too, to take a new look at the management of public lands. President Johnson has stated: "If we are to do today what tomorrow requires, we must proceed without delay on a national program to set aside the parks and seashores, the wildlife refuges and the waterfowl wetlands which our future generations will need."

Certainly, because fish and wildlife are vital to so many forms of outdoor recreation, there is a need for more stringent conservation measures to protect these resources.

Now, if I have in any way convinced you as a sportsman that outdoor education would be desirable, or is even necessary, for our 50 million schoolchildren, where do we go from here? How do we go about seeing that every child at least gets an introduction to these leisure-time activities, so that he or she will get to know that there are cool, green forests and clean streams with trout and bass, that there are fishing rods and tents, guns and canoes, birds and flowers and all the other things that make the out-of-doors and outdoor sports so fascinating and rewarding?

I think that this has to be a federally sponsored project, with money allocated to help schools set up such a program. I also realize that it will require acceptance by state educational departments and local school boards.

In addition to the legislative needs and the "official" sanction within the states, trained instructors are going to be necessary to make the effort a success. Already some universities offer courses in outdoor recreation. At Michigan State University, teachers can get graduate credit in outdoor recreation during a summer short course. Other universities would certainly include this training in their physical-educa-

• **continued on page 27**

C. N. Stroud - Multi-barreled Conservationist

by Sam F. Poole

Wildlife Biologist

MR. C. N. Stroud, who resides at Morehead City is one of North Carolina's many dedicated farm game workers. For the information of those who have not been contacted by one, a farm game worker is a part-time employee of the Wildlife Commission. These workers (about 60 in number) are hired to assist the district game biologists in carrying out the Commission's farm game program. This program is designed to help farmers and sportsmen improve small game hunting by providing supplemental food and cover for quail and rabbits on the farmlands of North Carolina.

What are some of the duties of these workers? In some districts most of the planting material provided by the Commission is delivered by the farm game worker. But the main duty of the farm game worker is to see to it that persons who request and receive planting materials plant them promptly, properly, and in suitable locations. Check-back calls are made to accomplish these objectives. These follow-up calls remind the cooperator that conditions are right for planting and encourage him to follow through.

Mr. Stroud has served in the capacity of a farm game worker for six years. He is a member of the Carteret County Wildlife Club, the Farm Bureau, and many civic organizations. His many conservation-related affiliations truly qualify him for the title of "multi-barreled conservationist."

Mr. Stroud and Ceasar Lawson, his able aide, have practiced wildlife conservation and soil conservation for many years on the Stroud Farm in Lenoir County. This farm is located near Albrittons, North Carolina. Sericea lespedeza, common lespedeza, peas, corn, and experimental plantings such as hairy indigo are all utilized for soil conservation and wildlife production.

The Commission's District 2 public dove management area is located on this farm. Three successful seasons of dove hunting have resulted from a well planned and well managed dove area. Ten acres of brown top millet are planted each June and cultivated three or four times to keep it free from weeds. Cultivation is necessary to make the seeds available to the doves.

Author Poole and Mr. Stroud make preliminary plans in sandy soil where many of the plantings will ultimately take place.

Mr. Stroud doesn't hunt a great deal but enjoys seeing other people participate in this fine sport. Many years ago, he paid $3.00, that he had earned, for his first shotgun, a single barreled H & R. As a boy he used to hunt birds and rabbits but didn't think of shooting doves for sport. He had an old bird dog named "Blue" that used to hunt the farm with him, and sometimes old Blue sucked hen eggs. Mr. Stroud broke him of this habit by filling an egg with linament.

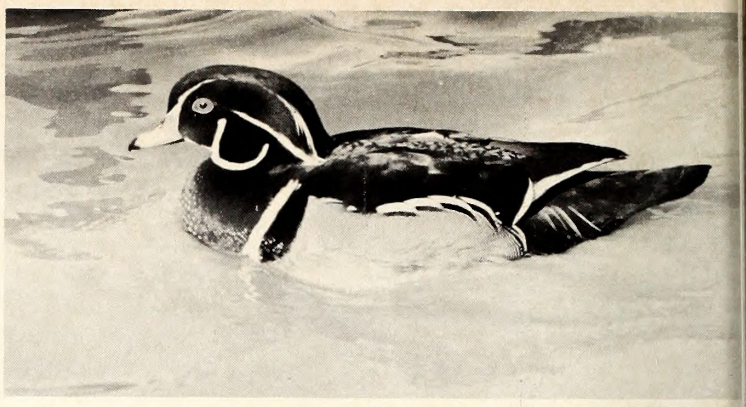
Mr. Stroud has taught school in Kinston and Pink Hill, served as principal in Bertie County, and was in the produce business in Havelock. In spite of all these accomplishments he says he enjoys this work with farmers and sportsmen as much as anything he has ever done. The effectiveness of his efforts in this direction is attested by the 140 cooperators whom he served in Carteret County this last planting season. Mr. Stroud encourages young people to get an education and then apply what they have learned by work, a philosophy he has followed with high productive results for many years.

Plans to enhance the farm for small game begin to take shape. Without careful supervision, many game habitat restoration practices are carried out incorrectly. Dedicated workers hold one key to success.

Part 1

by John P. Hardister
Wildlife Biologist

Life History and Management of the Wood Duck



JACK DERMID

AS the rising sun sends rays of light streaming through the treetops, a pair of ducks emerge on whistling wings from the dim shadows of a forest in eastern North Carolina. They bank and descend to the still surface of a small woodland pond with scarcely a ripple to disrupt the mirror image that instantly reflects every minute detail of body color and design. The plumage of the hen, grey-brown with white throat and white eye patch, is somber in comparison with the splendid iridescent colors of her mate.

The sleek, crested head of the drake appears green at first but changes to bronze then purple as he turns in the rays of the early morning sunlight. In contrast, the throat is pure white with two curving white bars extending into the dark cheek. The back of the neck is a satiny black. The bright vermillion eye remains ever alert to danger. The bill is black in the center and at the tip, pinkish white in the middle, and scarlet at the base bordered by a narrow band of yellow.

The breast is burgundy spotted with white and fades to an immaculate white belly. Two vertical bars, one white and the other black, adorn the side of the chest in front of the folded wing. The sides are finely patterned with buff and outlined with black feathers in a curve which are margined with white. At first, the iridescent feathers of the back appear black but change to purple and then turquoise as the drake moves about. The male wood duck is truly unsurpassed in beauty among North American waterfowl.

Distribution

The wood duck, scientifically known as *Aix sponsa,* is stictly North American in distribution. Its range is restricted primarily to deciduous forest areas of the eastern half of the continent since its habitat requirements consist of: (1) the brushy borders of permanent fresh-water ponds, lakes, and streams for feeding, resting, and the rearing of young; (2) tree cavities for nesting, and; (3) swampy areas for roosting. Woodies occur in suitable habitat from Florida into New Brunswick and from Southeastern Texas into northwestern Minnesota. A separate and distinct population occurs from central California into southern British Columbia. Wood ducks breed throughout their entire range but northern birds prefer to spend the winter months in the southern states. The western population winters in California.

The wood duck is the only species of waterfowl native to North Carolina.* It may be found throughout the entire State at all seasons but is most abundant in hardwood bottomlands bordering streams, ponds, and lakes of the Piedmont and in the cypress—tupelo gum swamps of the Coastal Plain. In the fall, resident populations are supplemented in number by an influx of wood ducks from the north. Some of these birds will winter in the State while others continue south. Undoubtedly some of the wood ducks that nested in North Carolina will spend the winter in states further south. Relatively few wood ducks are encountered in the mountainous sections of the State due largely to the lack of suitable habitat, although woodies may be encount-

*The black duck, gadwall, and blue-winged teal nest sparingly along the Outer Banks but present an exception rather than the rule as these species ordinarily nest much further north.

Hardwood swamps are constantly in danger of destruction by drainage. Without them, ducks and other water wildlife leave.

JOEL ARRINGTON

ered on almost any pond, stream, river, or lake during the periods of spring and fall migration.

Importance

The wood duck is of economic importance to citizens of the Tarheel state in terms of both tangible and intangible values. Each year numerous sportsmen enter blinds or travel inland rivers in search of this and other species of waterfowl. Their purchases of sporting equipment, ammunition, food, lodging, etc., contribute materially to the economy of the State. In the Atlantic Flyway, of which North Carolina is a part, the wood duck and mallard are second only to the black duck in terms of the total duck kill. Aside from the sport involved, wood duck flesh is delicious. Producers of fishing lures value the plumage of the male wood duck for tying artificial flies. Many wood duck feathers have contributed toward additions to the fisherman's creel. Then, too, the male's plumage carefully mounted by the experienced taxidermist is an item of beauty to adorn the sportsman's den.

As for intangible values, the wood duck ranks high on the list of those persons who enjoy the pursuit of birds with binocular and camera. Actually, few Tarheels are aware of the wood duck's existence, yet all but the most callous individuals are enthralled when they chance to encounter the woodie at close range in its native habitat. No matter how varied our interests in the wood duck may be, we share one interest in common—the desire for sound management of the species.

If we are to continue to derive benefit from the presence of wood ducks, as well as other valuable species of wildlife, we must realize more fully the value of good management practices. Of equal importance, we must refrain from those practices which prove detrimental to the species, especially with regard to the wanton destruction of wood duck habitat. Sound management practices and an abundance of suitable habitat can produce a surplus of wood ducks for harvest and provide brood stock for insuring continued survival for the enjoyment of future Tarheel citizens. Furthermore, if we and our children are to derive maximum benefit from this valuable part of our natural resources, we must put good management practices into use today.

The wood duck has perhaps suffered more afflictions than any other species of duck. By the early 1900's, conservationists feared extermination of the species because the combined effects of habitat destruction and non-restrictive shooting had seriously depleted wood duck numbers. The Migratory Bird Treaty Act of 1918 granted full protection from legal shooting and saved the species. This protection resulted in a general increase although the woodie was still rare in many areas where it was formerly abundant.

By 1941 wood duck numbers, were sufficient to warrant an open season in 15 states, permitting one wood duck per day and one in possession within the waterfowl hunting season. The practice of erecting wood duck nest boxes to alleviate losses of natural nesting cavities coupled with restricted shooting were probably the two main factors responsible for further increases in wood duck numbers. Since 1959, two wood ducks per day and two in possession within the waterfowl hunting season have been permitted. This increase in the bag limit has not adversly affected the wood duck population at the present time, although the ease with which wood ducks will decoy may possibly restrict the bag limit to its present level for yet some time.

Species Management

Within recent years a serious decline of many other species of North American waterfowl has caused concern among conservationists and sportsmen alike. In order to meet this crisis, biologists have focused attention on year-around habitat needs and placed increased emphasis on "species management." In the Atlantic Flyway, and particularly in North Carolina, the wood duck is a species which has particular management significance. Let us examine various aspects of the wood duck's life cycle, gained through many years of patient scientific research, and see how this knowledge may be applied to successful management of the species.

In North Carolina wood ducks begin to seek a nesting site in late January or early February depending upon weather conditions. Nesting will continue into June and occasionally later as hens renest whenever their nests are destroyed. Adult females usually begin nesting earlier than yearling females and will often nest in the same tree cavity where they nested successfully the year before. Yearling females have a strong tendency to nest in the area where they were hatched. This is not the case with the male.

Wood ducks pair in mid-winter while on their wintering areas in the south. A particular wintering area may contain woodies from many different parts of their eastern range. Pairing occurs on the wintering area and when pair bonds are formed the drake follows the hen everywhere she goes returning with her to her choice of breeding area. Thus, the breeding area of the female with which a male chances to mate determines the breeding place of the drake. A male hatched in Maryland may chance to mate in a South Carolina swamp with a hen from Vermont one year and a hen from Ohio the second year. Thus, as he accompanies each mate to her nesting area, he will breed in Vermont the first year and in Ohio the second year, returning south each winter.

Nesting

Wood ducks generally begin their search for a suitable nesting cavity early in the morning. Resorting to wooded areas near water, the pair, led by the hen, alights on a horizontal tree limb. From this vantage point the hen cranes her neck in every direction looking for a cavity in the main trunk of a tree. When she finds one she perches woodpecker-fashion at the entrance, her tail acting as a brace. Often she spends considerable time peering

inside before entering.

Many tree cavities may be inspected by the hen before one is chosen as a nesting site. While the female is conducting her inspections the male remains nearby and warns her of impending danger. Once a nest site has been chosen the female does not add any nesting material but utilizes whatever litter the cavity may contain. Nest sites may be located over water, at the water's edge, or as far as one mile or more from the nearest water. Although wood ducks show a clear preference for nesting in close proximity to water, the distance from nest sites to water areas depends mainly upon the availability of suitable nesting cavities.

Egg-laying generally takes place early in the morning and at the usual rate of one egg each day. The drake accompanies his mate and waits nearby while she spends from five minutes to an hour in the nest, then the pair departs until the next day. Clutch sizes vary from 6 to 19 eggs or more, but the average number of eggs is 12. The hen completely covers her eggs with litter before leaving the nest unless she is frightened away. This keeps the eggs from the sight of would-be predators. When the sixth or seventh egg has been laid the female plucks a small amount of down from her breast for lining the nest. She continues this practice for the remainder of the egg-laying period and the nest is completely lined with down by the time the clutch is complete. When the hen covers the eggs prior to departing the nest during the incubation period, the down will serve as an insulating blanket to keep the eggs warm.

Incubation generally begins the day following the completion of the clutch. The hen alone incubates and she remains on the nest day and night throughout the usual 30-day incubation period. She leaves the nest twice daily, once in the early morning and again in the late afternoon, to rest and feed with her mate. The drake accompanies his mate when she returns to the nest. He may remain nearby for an hour or more waiting for her to leave the nest and rejoin him, but when

she fails to do so he departs. As the time approaches for the eggs to hatch the male no longer returns with the hen. The bonds that held the pair together have been broken and the male joins other adults of his sex. The hen performs the task of raising the brood without the aid of her former mate.

All the eggs hatch at about the same time since incubation does not begin until the clutch is complete. Ducklings emerge into the world wet, weak, and bedraggled in appearance. The hen broods them and they soon become dry and fluffy. Their first day of life is spent in the warm confines of the nest beneath their mother's wing.

The exodus from the nesting cavity usually occurs early in the morning of the ducklings' second day. The hen returns from feeding and enters the nest to brood the young. She soon reappears at the entrance and spends a considerable amount of time inspecting the surrounding area for possible danger. When she is assured that the exodus can be made in safety, she flies to the ground or water beneath the nest and calls to the ducklings. "Kuk, kuk, kuk" is repeated softly. Instantly the young respond with a chorus of peeping cries and begin climbing the walls of the nest cavity toward the entrance.

The ducklings are especially adapted for climbing as nature has equipped them with sharp, hooked, toenails for this purpose. They jump toward the light coming into the dark nest, cling to the walls with their toenails, then hitch their way up to the entrance. Ducklings do not often gain the entrance the first time but repeatedly fall over themselves in their efforts to climb the walls. They are persistent and soon make the climb successfully. Seldom do they hesitate at the entrance but jump into space without regard for the distance to the ground or water.

Many nest evacuations have been observed and no one has yet reported a single case where a duckling has been injured, even when the nest entrance has been as high as 80 feet above ground. Ducklings bounce like little rubber balls upon contact with the ground. Their soft, fluffy down and light weight prevent injuries.

Usually the ground or water is from 10 to 25 feet beneath the nest, therefore the fall is not great for so light an object.

Departures from many nests usually take but a few minutes as ducklings make the climb up the sides of the nest three and four at a time and often jump from the entrance two and three at a time and in rapid succession. Once ducklings gain their mother's side, they instinctively huddle in close formation and cease peeping. When the hen no longer hears peeping cries from the nest she gathers her brood and leads them to the nearest body of water. If this water area is a considerable distance from the nest she will lead the ducklings overland by the most direct route. If the journey is a long one some ducklings may be lost on the way.

Ducklings are taken to water areas where vegetative cover provides them with places to hide as well as plant and insect life to eat. Young wood ducks grow rapidly and are usually able to fly when about eight weeks old. The hen remains with her brood during this time but generally spends less time with them with the passing of each week. By the time they have attained flight, she has completely abandoned them. The young wood ducks assemble in small groups with other broods and wander from place to place throughout the remainder of the summer. When fall arrives they migrate to the southern wintering areas. Next month Part II will discuss management of the wood duck and emphasize the role *you* can play in the conservation of this valuable wildlife species. ⬍

NORTH CAROLINA WILDLIFE

RESOURCE-O-GRAM

A ROUNDUP OF THE LATEST WILDLIFE NEWS

WILDLIFE Hits All-time Peak

With this issue of Wildlife in North Carolina the total monthly circulation is in excess of 100,000 copies. With an estimated reader exposure of five people per copy, this means half a million readers each month, and makes Wildlife one of the top magazines in the nation in circulation and readership.

1966 Fishing Regulations, Licenses in Effect

The 1966 fresh-water fishing regulations have been published and distributed to license dealers throughout the state. Copies of the regulations are available with the purchase of 1966 fishing licenses required effective New Year's Day. Combination hunting-fishing license holders, whose licenses are effective until July 31, and persons fishing with these licenses may get fishing regulations from license dealers, wildlife protectors or the Commission's Raleigh office.

Migratory Game Bird Seasons Close in January

January 8 marks the close of the season on woodcock, snipe, ducks, coot and mergansers. On January 13 the second segment of the split dove season ends. Goose hunting closes out on January 14.

It's Boat Registration Time Again

All persons who registered boats during 1965 have been sent boating certificate renewal notices, and state law prohibits the operation of a boat powered by machinery of more than ten horsepower without having aboard a valid 1966 boat registration certificate, plus certain life saving devices and other safety equipment. In 1965 a total of 51,670 boats were registered, and this figure will be exceeded this year if past trends hold.

HAPPY NEW YEAR!

The Wildlife Resources Commission and all its personnel including the staff of Wildlife take this opportunity to wish you and yours a Happy New Year!

Rafinesque's Big-eared Bat

by Dr. F. S. Barkalow, Jr.
Photos by the Author

ONE of North Carolina's most photogenic inhabitants is *Plecotus rafinesquii* — Rafinesque's Big-eared Bat. Of the four species of large eared bats in the temperate parts of North and Central America only Rafinesque's bat is known to occur in North Carolina. None of the big eared species in the New World is abundant anywhere, and two species, the Spotted Bat, *Euderma maculatum,* and Allen's Big-eared Bat, *Plecotus phyllotis,* are known from less than two dozen specimens of each.

It is possible that Townsend's Big-eared, *Plecotus townsendii,* may also occur in North Carolina since it has been taken at Burkes Garden, Tarzewell County, Virginia, near the northwestern corner of our state. However, no representative of this species has as yet been identified from North Carolina. Townsend's Big-eared Bat roosts and hibernates in caves, while Rafinesque's Big-eared Bat prefers buildings and hollow trees.

Plecotus rafinesquii is unsociable and is rarely found in company with or even in close proximity to other species at its roosting site, even in winter concentrations. Moreover, it is unusual to find more than a few individual Rafinesque bats hanging together; whereas, concentrations of as many as a thousand Townsend bats have been observed hibernating in a cave. Neither the Rafinesque nor Townsend bats are known to migrate although they are both strong fliers.

The most striking feature of *Plecotus rafinesquii* is its enormous, flexible, black ears which are curved backwards and flattened against its neck while the animal is asleep. When at rest the rear portion of the ears is usually folded like the bellows of an accordian, and the ears are sometimes thrown forward without opening the rear portion which gives the bat the appearance of possessing horns. When he is awakened his ears may be snapped upright or straightened very slowly, and before he takes flight the ears may be waved alternately or in unison, giving the bat a rather fearsome appearance.

The adult bats measure approximately 3 15/16 inches from the tip of the nose to the tip of the tail of which the head and body measures approximately 2 1/16 inches and the tail about 1 7/8 inches. The ears are between 1 1/4 and 1 3/8 inches long and when laid backward reach almost to the hips.

The wings are blackish and measure about 11 inches from tip to tip when expanded. The body is covered with soft, wooly fur with the hair on the back being blackish at the base and either reddish brown or yellowish brown on the tips. The basal and tip portions of the back hairs are sharply demarked. The throat, chest and belly hairs have whitish tips with strongly contrasting black or blackish bases.

The Townsend bat is similar in coloration and almost identical in size to Rafinesque's bat, but *Plecotus townsendii* lacks both the whitish tips on the hairs of its underparts and the sharply demarked belly and back hairs.

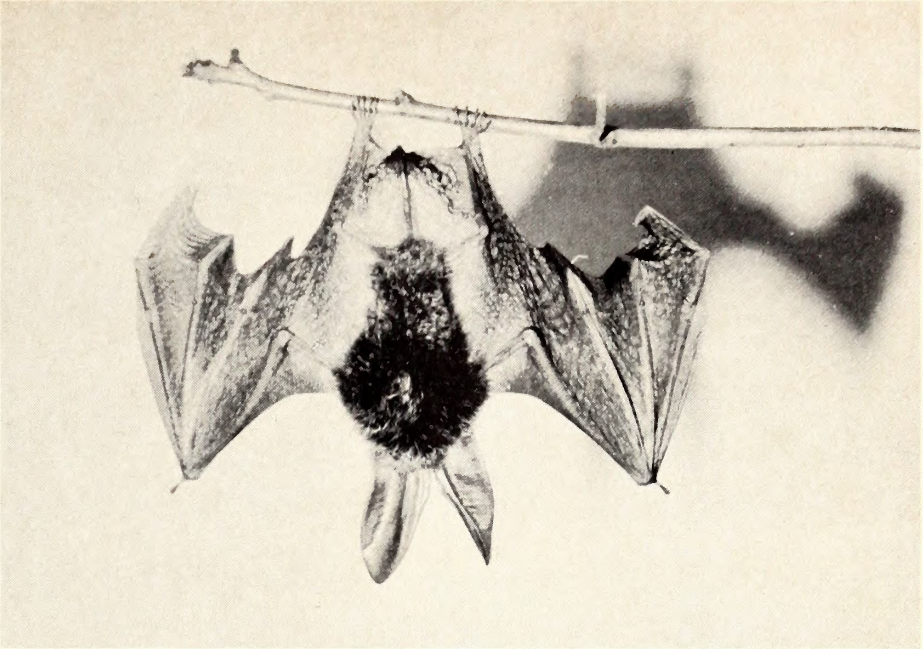
The food habits of the Rafinesque bat have never been studied. It is known that these bats do not leave their roost until after dark and are reported to fly at high altitudes until it becomes pitch dark, at which time they fly nearer the ground. It is believed that they feed largely on night-flying moths, but this is a matter of inference drawn from the food habits of their close relative the Townsend bat.

P. rafinesquii is a bat of the forested areas and is rarely found in caves even when their range overlaps areas with numerous caverns. When they do occur in caves, they appear to hang up near the entrance and to occupy them primarily during the colder months of the year. The species is usually found today in abandoned buildings and occasionally the attics of occupied dwellings, but originally it is thought to have occupied hollow trees and crevices under the bark.

Many species of bats become quite tame and do well in captivity, but the Rafinesque Big-eared Bat is a very shy and sensitive creature that usually lives only a few days following its capture.

Nothing seems to be known about the longevity of the species, but it is suspected that they are very long-lived—perhaps 20-25 years—as are some of their other relatives in the family Vespertilionidae.

The reproductive habits of this species are not known with certainty, but there is some evidence which indicates that the species is capable of breeding in late fall or early winter but that pregnancy does not result until the following spring. A single young is produced in late May or early June in a nursery colony. The young grow rapidly and most have shed their milk dentition by late July. They reach adult size by mid-August and assume their



At left, a big-eared bat poses for a portrait, its tiny eyes all but hidden by the leathery ears. Above, a young bat folds its wings in a characteristic resting position. Note the tightly clasped toes clinging to the tree limb.

adult pelage in early September. The female probably bears her first young at one year of age.

In the Rafinesque bat as in many other species, the pregnant females congregate in isolated groups in locations away from the males. When the young are born they are carried by their mothers during her feeding flights until they become too heavy to transport, at which time they are left hanging in the "nursery" while the mother goes in search of food.

In some species the nursery colonies may consist of several thousand adult females and young; while in others, as in the case of *Plecotus rafinesquii,* they rarely exceed ten to twenty adult females with young.

Two nursery colonies in North Carolina have come to my attention, one located near Royal, Beaufort County, was reported by Mr. Derwood Jones, a senior in Zoology at N. C. State. The colony of about 15 individuals was located in an abandoned house surrounded by a heavily wooded area. Derwood collected six specimens on 4 July, and on 23 July he captured four more. The bats photographed for this article were captured on 23 July. David A. Adams reported a nursery colony in an old abandoned house near Kelly, Brunswick County, North Carolina, in July 1965. This colony consisted of approximately 30 adults with young. All adults captured proved to be female and all of the young in the colony were capable of flight.

Dr. C. O. Handley, Jr. in his revision of the big-eared bats (Proc. U. S. Nat. Museum, vol. 110, pp. 95-246, 1959) lists two subspecies of *Plecotus rafinesquii* occurring in North Carolina. The ranges of these subspecies according to Dr. Handley, are as follows:

Plecotus rafinesquii rafinesquii Lesson

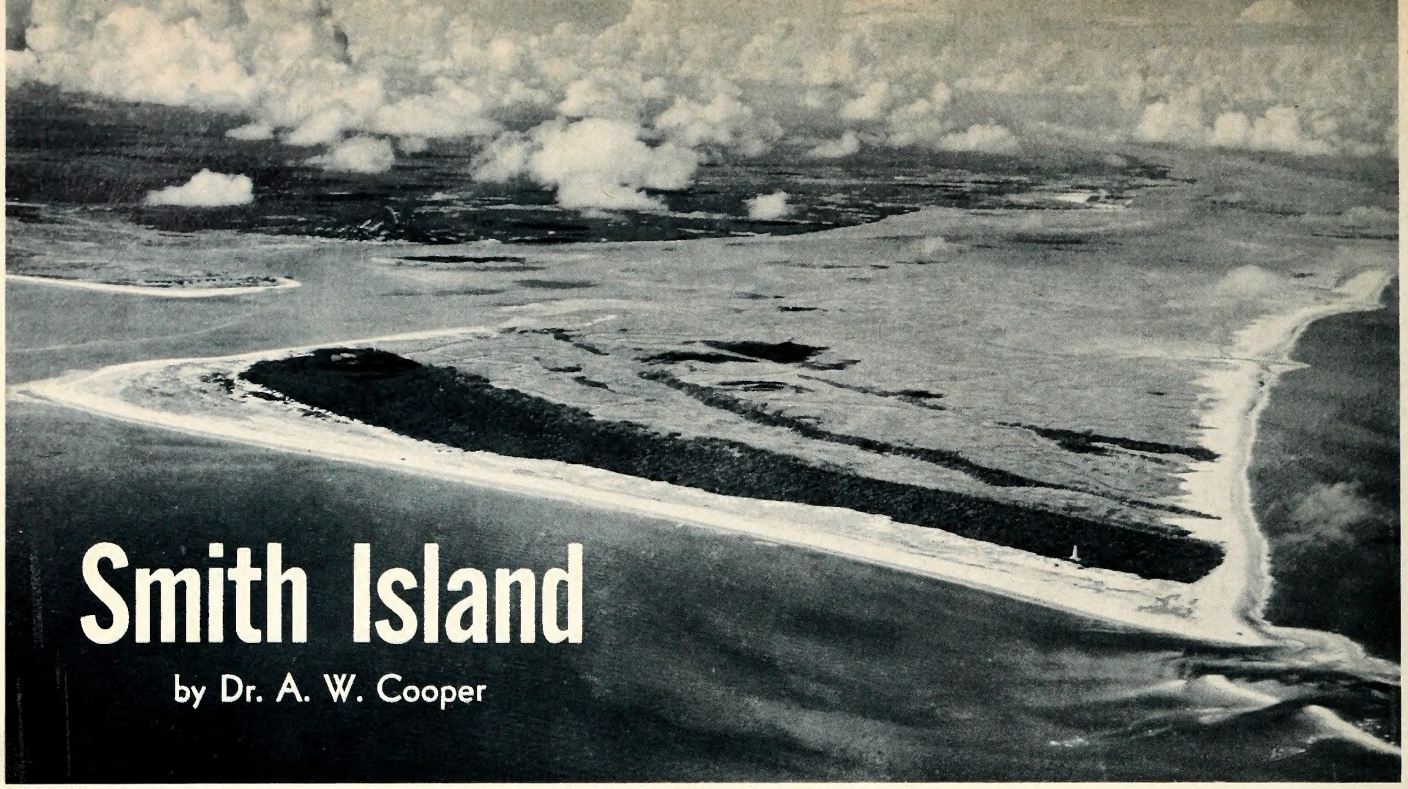
"Distribution: East-central United States—. North to Nicholas County, W. Va.; Adams County, Ohio; Putnam County, Ind.; Wabash and Alexander Counties, Ill. West to Putnam County, Ind.; Alexander County, Ill.; and Obion County, Tenn. South to Obion County, Tenn.; Colbert and Madison Counties, Ala.; Towns County, Ga.; and Macon, Transylvania, and Alexander Counties, N. C., East to Alexander County, N. C. and Nicholas County, W. Va. — Altitudinal distribution: From 400 feet above sea level in western Tennessee to 3,850 feet in western North Carolina."

Plecotus rafinesquii macrotis Le Conte

"Distribution: Southeastern United States—. Northeastward to Dismal Swamp, Va. Southwestward to Terrebonne, West Baton Rouge, and Natchitoches Parishes, La.; and McCurtain and LeFlore Counties, Okla. Inland to Dismal Swamp, Va.; Bertie and Wayne Counties, N. C.; Darlington County, S. C.; Autauga and Green Counties, Ala.; Kemper County, Miss., and Crawford County, Ark.—. Altitudinal distribution, sea level to about 500 feet."

The records for the occurrence of these subspecies in North Carolina based upon the records in the literature and in our collections are as follows:

Plecotus r. rafinesquii	
Buncombe Co.	1 specimen
Cherokee Co.	1 specimen
Madison Co.	1 specimen
Swain Co.	6 specimens
Probably *P. r. rafinesquii*	
Alexander Co.	5 specimens
Macon Co.	1 specimen
Transylvania Co.	1 specimen
Plecotus r. macrotis	
Beaufort Co.	10 specimens
Bertie Co.	1 specimen
Bladen Co.	2 specimens
Robeson Co.	1 specimen
Wayne Co.	1 specimen



Smith Island

by Dr. A. W. Cooper

JACK DERMID

ALONG the heavily populated east coast of the United States few areas have escaped the heavy tread of civilization. There is little to remind us of the original beauty of our coasts. North Carolina, however, is fortunate to possess one of the few remaining wilderness areas along the Atlantic Coast. This area is Smith Island, to many Tarheels known as Baldhead. Because of its isolation, few North Carolinians have had the privilege of visiting this fascinating and historic island. Unfortunately, however, plans are being made for its development and, if steps are not taken to preserve its natural features, this last North Carolina coastal wilderness will disappear, transformed into a jungle of concerete, beach houses, and hotels.

Smith Island is located in the mouth of the Cape Fear River in southeastern Brunswick County. The island is actually a complex of over 10,000 acres of dunes, live oak forest, salt marsh and shallow salt water. Its southernmost point of land is Cape Fear and stretching away from the Cape to the southeast lie Frying Pan Shoals and some of the finest salt water fishing in North Carolina. Smith Island's marshlands have provided generations of Brunswick County residents with excellent marsh hen and waterfowl hunting. The island is a sportsman's and naturalist's paradise and, because of its beauty and recreational potential, deserves to be preserved for the future enjoyment of all North Carolinians.

Geologically speaking, Smith Island is young, being perhaps no more than 100,000 years old. Prior to the last advance of glaciers in the far north, sea level stood perhaps 25 feet higher along our coast than it does now and lands lying seaward of this ancient shoreline were underwater. As the glaciers advanced, sea level dropped to as much as 300 feet below its present level. Smith Island was formed on this falling sea.

Much evidence suggests that the climate and plant and animal life were much different then, with spruce and northern pines dominating a landscape which resembled that now found in Canada. When the glaciers began their retreat, perhaps 20,000 years ago, sea level rose and the North Carolina coast was slowly "drowned."

Today, Smith Island stands as clear testimony to the rapid changes of climate, plant, and animal life which have taken place along our coast during the last 10-20,000 years. Although it is not correct to think of the island as truly subtropical, its plant and animal life are much more like that found along the coasts of Georgia and South Carolina than along the northern North Carolina coast. There are four major kinds of communities of plants and animals found on Smith Island: low salt marsh, dunes and shrub thicket, live oak forest, and shallow coastal water. Perhaps the most important natural feature of the island is the fact that each of these communities is as well, if not better, developed than at any other place along our coast.

The most extensive community and perhaps the most important (from an economic point of view at least), is the low salt marsh. Low marshes, dominated by vast stands of smooth cordgrass, cover all of the saline soils below mean high tide between Baldhead Island and Federal Point. The smooth cordgrass grows quite tall along the tidal creeks where the salinity seldom exceeds that of sea strength and

where drainage is good. But, farther back, in the area between creeks where salinities are higher and drainage poorer, the same cordgrass is very short, often being less than one foot in height. In the highest parts of the low marsh, near high tide line, glasswort and sea lavendar grow with the dwarf cordgrass. Pure stands of black needle rush occur just above the mean high tide line. At higher elevations, which the tide only infrequently reaches, saltmeadow grass, saltgrass, and sea oxeye occur in the "high" marsh, which in turn quickly gives way to shrub thickets dominated by yaupon, groundsel, and marsh elder.

These salt marshes are of great importance to the salt water life of the lower Cape Fear River. Studies done in similar kinds of salt marshes in Georgia show that the salt marshes and shallow coastal waters are one interdependent system with much of the system's food materials produced in the marshes. The Georgia studies have shown that low salt marshes may produce as much as 10 tons of organic matter per acre per year. About half of this is swept out of the marshes by tides and serves as part of the basic food material eaten by many of the animals of the shallow coastal waters. Many of our most important sports and commercial fish and shellfish, such as oysters, clams, crabs, juvenile shrimp, flounder, menhaden, and bluefish, utilize these materials produced in the marshes as sources of food at some time during their lives.

The dunes on the southern shore of Smith Island are among the most beautiful and stable in North Carolina. There is a well-developed zone of low dunes along the beach and another zone of high, withdrawn dunes between one-fourth and one-half mile from the beach at the edge of the forest. These dunes rise to over 50 feet in several places. Both dune systems, and most of the lower hummocks between are densely covered with sea oats. In midsummer they have much the appearance of a waving field of grain. This dense cover of grass makes these dunes much more stable than those along most of our coast where man has removed the native grasses by grazing, burning, and development. The dunes on Smith Island were burned and grazed up to the 1930's, and those familiar with the island say that the southern shore then was a sea of shifting sand. These unstable dunes rapidly migrated over the edge of the forest at that time as the dead trunks of cedars, live oaks, and palmettos now in front of the withdrawn dunes show. These dunes show, perhaps better than any others on our coast, the ability of coastal dunes to become stabilized by natural processes when freed from the disruptive activities of man.

The eastern shore of the island is very different. Here the beach is very narrow and there are no high dunes. The sea has eroded into this shore extensively. Aerial photos show that the eastern shore eroded inward between 400 and 800 feet between 1938 and 1961. At the heads of the main creeks there are wide areas where the sea has washed over during storms and ends of each of the islands on the east have been cut into 4-5 foot cliffs.

The live oak forest on Smith Island is probably the last remaining stand of this kind of forest in the State. Most other areas have either been cut up and turned into developments or destroyed by coastal erosion. Although live oak is the dominant tree many other kinds are present and some are locally dominant. Palmetto is abundant, and actually reaches its northernmost location in North America on Smith Island. Red bay, laurel cherry, American holly, American olive, dogwood, and loblolly pine are some other important trees. The commonest shrubs are yaupon, wax myrtle, and the beautiful French mulberry. The dominant trees average 50 feet in height. In places, the top of the canopy forms a more or less continuous, smooth surface, due to the shearing effects of the winds laden with salt spray which blow off the ocean. Although trees characteristic of inland areas, such as beech, musclewood, and hickory are often found in coastal forests in other areas, none occur on Smith Island. This is undoubtedly due to the extreme exposure of the island to heavy salt spray which these inland trees cannot tolerate. The forests on Smith Island were the place where Dr. B. W. Wells, first plant ecologist at N. C. State University, initially discovered the importance of salt spray to the growth of coastal plants.

JACK DERMID

Standing like two sentinels guarding the island, these palmettos form a part of the fascinating vegetation there.

Evidence from early records shows that a live oak forest similar to that of the present has existed on Smith Island since at least 1805. Although the present forest is extensive and well-developed, it has suffered a number of disturbances in the past. At its western end, on the Cape Fear River, it was badly disrupted by the building of Ft. Holmes during the Civil War. Palmetto logs were taken and used to strengthen fortifications, both on the island and at Ft. Fisher. Red cedar was heavily cut in 1926 and it appears that some of the live oaks in the canopy now may be dying.

Relatively little is known of the animal life of the island. Grey fox, raccoon, and squirrels are

North Carolina State Library
Raleigh

abundant in the uplands and otter and mink are common in the marshes. Pigs and sheep lived wild on the island for many years, but now only the pigs remain. The Florida wood rat, a rodent characteristic of more southern areas, was collected in 1940. Vast numbers of birds frequent the island. Herons and egrets feed extensively in the marshes and on the mud flats. The most important bird habitat associated with the island is Battery Island, lying in the Cape Fear River just off Southport. Here thousands of individuals of egrets, ibis, and herons nest in a small area of shrubs and many terns, black skimmers, shore birds, and even some land birds nest on the open sand flats.

The marine life in the waters near the island is particularly rich. In the tidal creeks hook and line fishing yields croakers, pigfish, spot, and some big tarpon. Surf casting on the beach brings in whiting, bluefish, and drum. Near the "Lumps" off Cape Fear the channels yield trout, flounder, black drum, and bluefish. In the waters adjacent to the shoals are king mackerel, dolphin, amberjack, barracuda, sailfish, and false albacore. Farther offshore are blue marlin. Sperm, black, and humpbacked whales and many sharks also frequent the ocean waters near the shore. Perhaps the most publicized animal associated with the island is the loggerhead turtle. These giant sea turtles, sometimes weighing half a ton, come ashore on the full moon in June to lay their eggs, and Smith Island appears to be one of the last safe breeding areas for this animal in the southeastern United States.

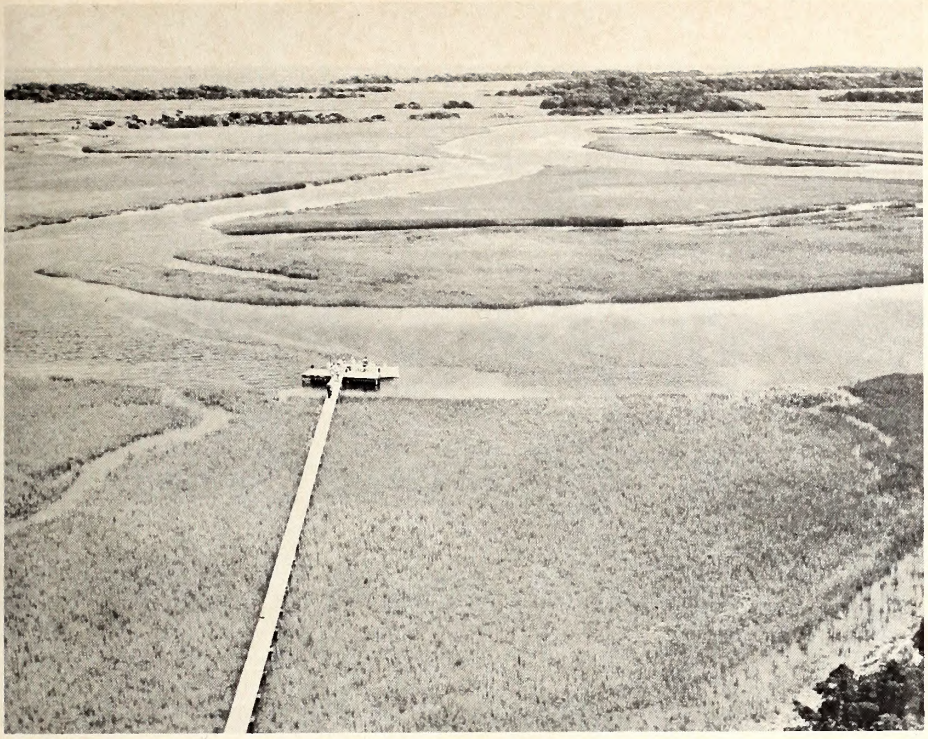
JACK DERMID

Smith Island displays almost subtropical vegetation and is the farthest north advance of the palmetto in the U. S. The island claims plenty of wildlife, but nearby Battery Island is the nesting site of these gull-billed terns and black skimmer (below).

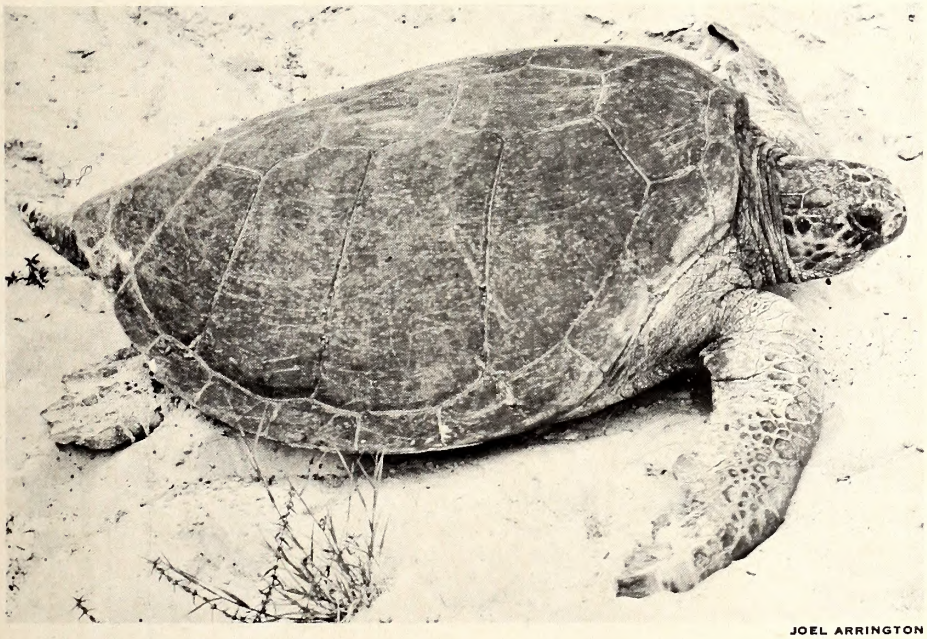
JOEL ARRINGTON

Because of its beauty and isolation, Smith Island's owners through the years have always looked on the island as a perfect spot for development. The present owner, Mr. Frank O. Sherrill of Charlotte and Flat Rock, is no exception. Mr. Sherrill bought the island in 1938 and many times since has professed his desire to establish there a resort of the "highest class." His latest development plan is grandiose but will spell total destruction to the island and its plant and animal life. The high dunes will be destroyed and the salt marshes entirely filled in. The forest will be removed and replaced by planted tropical palms. The island will be transformed from a wilderness to a year-round city of 60,000. Smith Island, as a natural feature of the lower Cape Fear, will no longer exist.

Many will say that the economy of Brunswick County needs the stimulus which Mr. Sherrill's development will provide and that the county cannot afford to have Smith Island preserved. The argument is not quite so simple. Smith Island, in its natural state, is worth a great deal of money to Brunswick County. Few people realize this fact and even fewer realize what Brunswick County would lose should the island be developed. It has been estimated that an acre of salt marsh land is worth at least $300 a year in terms of the value



The Island has numerous salt marsh areas which produce food for resident fish and sea mammals. Ponderous sea turtles find Smith Island beaches one of the last safe egg-laying areas in the southeastern United States. It is certainly worth saving.



JOEL ARRINGTON

of the products, fish and shellfish, which it produces. Thus, the 8500 acres of saltmarsh and shallow water on Smith Island may be worth $2,550,000 a year and as much as $127,500,000 over the next 50 years. If Smith Island were developed, these marshes would be destroyed and their value to sports and commercial fishing would be lost forever.

Stable coastlines are also worth money these days. There is every reason to suppose that if Smith Island were developed the now stable coastline of the island would rapidly lose its stability and erosion would begin. Estimates for the repair of erosion damaged beaches elsewhere in Brunswick County, made by the Army Corps of Engineers, are about $500,000 per mile. Inasmuch as a large part of the cause of the coastal erosion in Brunswick County is unwise development, it would appear that the stable 12 miles of coast on Smith Island are worth about $6,000,000 in the undeveloped state.

Tourism is a booming business in North Carolina today. One thing which serves as a powerful attraction to the tourist is wilderness and natural beauty as they are preserved in our State and National Parks. In 1964, over 1 million visitors streamed through the Cape Hatteras National Seashore and over 500,000 enjoyed Ft. Macon State Park. Many of these visitors bought meals and stayed overnight near the parks. Thus, there is a way in which Smith Island could be preserved and still serve as an important source of income for Brunswick County. If the Island were made a State Park, its natural features would be preserved for the future. Furthermore, it would serve as a major feature to attract tourists to Brunswick County, serving as an excellent complement to the battleship North Carolina, Old Brunswick Town, the Orton Plantation, Southport, and Calabash. Just 200,000 additional visitors a year, attracted to Brunswick County by Smith Island, and spending $25 a day each, would mean $5,000,000 more each year to the county. Thus, it is clear that parks mean big money to the areas in which they are located.

Perhaps even more important for the future of North Carolina is the need for her citizens to recognize the importance of conserving areas of natural beauty and importance in the State because of their intrinsic values. Tarheels take pride in the fact that their cultural history is preserved for future generations to see. Sadly, however, few realize that the natural plant and animal life of North Carolina, as it was in the days of early settlement, is also very much a part of their cultural heritage. If steps are not taken, and soon, to insure preservation of representative portions of our State, our sons and daughters may never know how beautiful North Carolina looked to their pioneer forefathers. Smith Island illustrates this point perfectly. It is the last vestige in North Carolina of a primitive coast line. North Carolina must act to preserve it. ⬍

REA Powerline Development

by S. Thad Cherry
Wildlife Biologist

THINGS were going about normal for a trip home. The station wagon rode like a Cadillac with its load of winter-weight clothes, suitcases, my shotguns and shells, and the family—my wife, myself, and my pointer, Lucky. We had been on the road just long enough for the wife to be nodding and ready to curl up for her usual traveling slumber. Lucky's traveling quarters in the rear of the wagon were cramped by suitcases and he was beginning to stir about and whine—his way of saying "You'd better stop and let me out of here for a few minutes."

Lucky's whining increased as I pulled off the highway onto a familiar dirt road alongside an REA powerline right-of-way. I stopped the car at the bottom of a hill, and as I opened the tail gate, the look in Lucky's eyes and his tailwag showed his appreciation for the "rest stop."

Lucky took a tremendous leap from the tail gate and hit the road, locked in a most awkward position. He didn't move. I wondered why in the world he didn't go about the business I had let him out for. Then he eased forward about two steps and acquired the classical pointing stance, and I realized what was going on. I had parked right beside a covey of quail.

My first impulse was to dig for a shotgun, but the pile of suitcases over the rear compartment discouraged that idea. Besides, we were runing late on our trip. But I did step ahead of Lucky and flush the birds. I counted nine birds on the rise—not bad for January. I watched the quail fly up the powerline right-of-way and then glide into the pines on the next hill. Needless to say, Lucky was so excited he forgot what we had stopped for, so I loaded him back into the car.

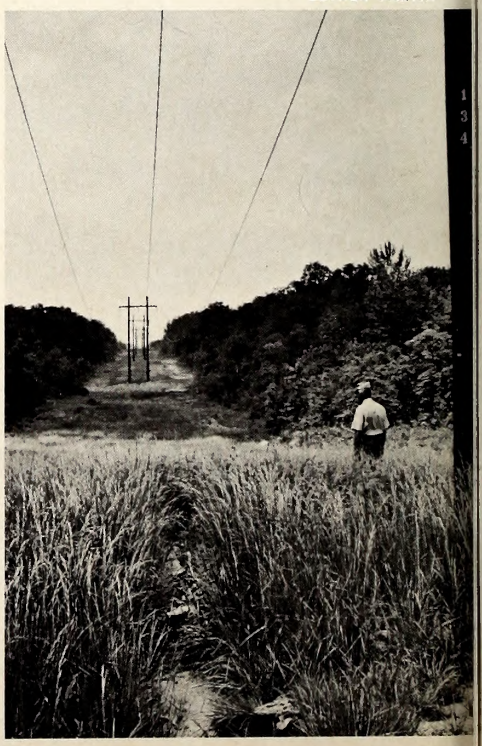
I'm sure other people have had similar experiences, but this one meant a little more than usual to me. You see, that was not the first time I had stopped at this right-of-way and this right-of-way itself is anything but normal.

This particular right-of-way lies under a transmission line of the Davie Electric Membership Corporation, and runs through Davie, Iredell, and Alexander counties. The spot at which I had stopped is typical of many of the non-farmed areas along the right-of-way. It has a dense growth of sericea and shrub les-

JOEL ARRINGTON

Not much real wildlife cover in the above right-of-way scene. A planting of fescue and ladino (below) will provide small game with nesting places.

LUTHER PARTIN



pedeza—choice wildlife cover and food.

In the fall of 1962, the Wildlife Resources Commission and the Davie Electric Membership Corporation initiated a cooperative pilot right-of-way planting project—perhaps the first of its kind in North Carolina. Rights-of-way have always posed a special problem for utility companies, in that they require periodic maintenance which is quite expensive. Sportsmen have long realized that rights-of-way create "edge" and are fair places to find game, but that ideal food and cover are usually absent. Soil conservationists have pointed out that soil erosion along rights-of-way can be a serious problem.

THE section of right-of-way selected to serve as one pilot project sported a three years' growth of native vegetation—weeds, pines, and hardwoods. It was in need of maintenance, and it was time to start the project rolling. It was decided that the center portion of the right-of-way should be seeded to sericea lespedeza, because of its comparative low growth, dense cover, and soil erosion control qualities. Borders of shrub lespedeza would be seeded to provide choice quail food.

First of all, the Electric Membership Corporation had the right-of-way disked with a heavy bog harrow. Then, the Wildlife Resources Commission contacted all landowners who owned woodland or non-cultivated strips of the right-of-way, and obtained applications for planting materials from all who wished to cooperate. If a particular landowner wanted his portion of the right-of-way planted, but was unable to do it himself, help was sought from neighbors, 4-H Clubs, Future Farmers of America classes, or local sportsmen.

The Wildlife Resources Commission furnished and delivered the planting materials to the cooperators, and the Davie Electric Membership Corporation furnished the fertilizer. So the spring planting season found the right-of-way busy with activity and over 70 acres of right-of-way were planted.

The plantings have been inspected periodically during the past three growing seasons. The first year's growth didn't look too promising. The sericea-planted areas grew thick in native vegetation, but upon careful examination, one could find a fairly dense growth of sericea below. The shrub lespedeza plants grew only a few inches high, but their root systems were well estabilshed. Korean lespedeza seed were mixed with the shrub seed, and made a good first-year show, producing a lot of seed.

THE second year's growth looked much better. The shrub lespedeza plants grew well and some produced seed. The sericea got a head start on the native vegetation and grew into a good thick, knee-high stand.

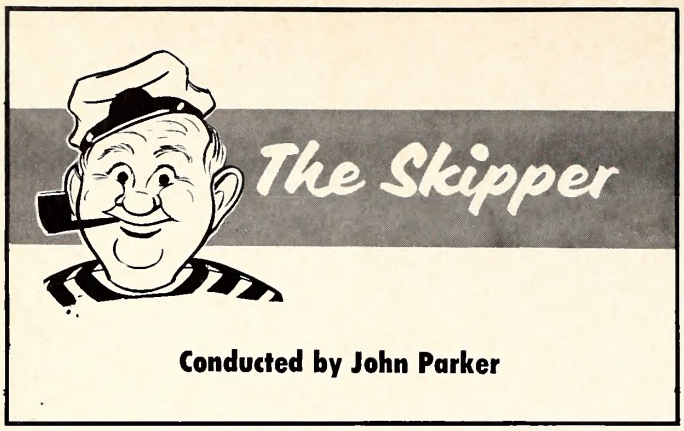
Last spring, the Cooperative had the plantings mowed with a bush hog. This was done just before the new spring growth started, and served to retard woody sprout growth while helping the lespedezas. The third year growth of sericea is virtually weed-free, and is over waist high. Almost all of the shrub lespedeza is bearing seed. It appears that the only maintenance the right-of-way will need is mowing with a bush hog every three years.

Of course, we hope that this and subsequent pilot right-of-way planting projects are only the beginning. It has long been the dream of conservationists and sportsmen that North Carolina's thousands of miles of utility rights-of-way will someday be planted in wildlife food and cover. With every day that passes, we are losing more of our valuable wildlife habitat to reservoirs, highways, shopping centers, residential areas and the like.

It may be that some day in the future quail will have had to adapt themselves to eating out of backyard bird feeders, and to roosting on clothes lines! But in the meantime, it seems that the development of our utility right-of-way may be one of our best untapped sources of small game habitat. ◆

The first step after careful planning, is the clearing of area and preparation of a good seed bed. Several plants can be used.

A power line planting of VA 70 shrub lespedeza is examined by Biologist Charlie Woodhouse on a Wake County site.



Conducted by John Parker

AT the time of this writing, it is apparent that there will be an increase in boating accident fatalities and an increase, to a lesser degree, in the *total* number of accidents. Why is this the case? Have we been more careless this season? Possibly, but the increase is more likely due to an increase in boating traffic or activity. This is due, of course, to more new boats being sold and more use by those already owning boats.

To date we have seen some serious boating accidents and some not so serious. The ones on record so far include a boat going over a high dam, running aground during night operation, explosion, operators being thrown from boat while riding on gunnel or back of seat, falling overboard while changing shear pin, etc. And the ski boat type of accident is up this year. Too many operators are trying to operate the boat and observe the skier at the same time. It can't be done effectively.

Safety may be all but forgotten in the excitement of a fish coming aboard. It's times like these that require even more caution. Be careful about standing or moving about in the boat.
EVINRUDE MOTORS

The accident that takes the most lives each year did not take a holiday in 1965. Falling overboard or going in the water due to capsizing is still the leading cause of death. There are perhaps two basic approaches to this problem. One is to keep your feet dry; while the other and perhaps more important because the skill is good to know, is to learn to swim, and keep calm if you do go overboard. All accidents are tragic but most disturbing is the one in which a perfectly healthy and strong individual slides beneath the water surface when grabbing hold of the boat would have saved his life.

Where have the accidents occurred this year? Here are the so-called accident hot spots—the Yadkin and Catawba River chains of lakes, the Wrightsville Beach area, White Lake, New River, Bogue Sound in the vicinity of Morehead City, Slocum Creek area of Neuse River and the Upper Pamlico River. The smaller waters of the Columbus County and the Chowan-Bertie area were sites of a number of accidents. Several other eastern counties and three western counties had one fatality each.

Clarification

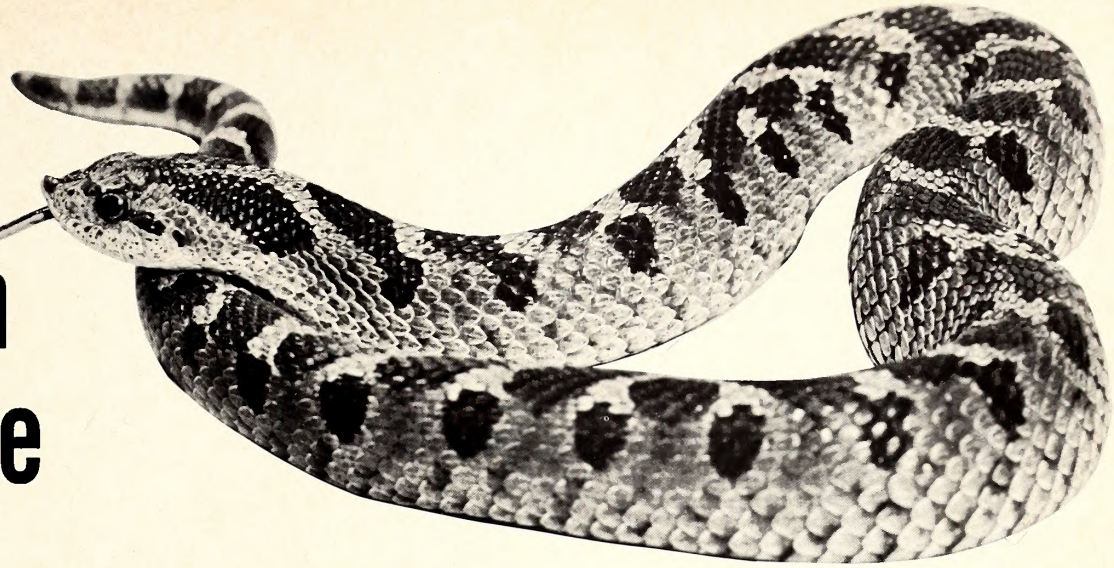
Some boaters have had questions concerning the use fees at Hyco Lake. This new lake, as you may know, was formed when the Hyco River was dammed. The river originates from Person and Caswell County creeks. It flows northeast into Virginia. The 3750-acre lake is administered by the Person-Caswell County Lake Authority which was established by the recent General Assembly. The basic boating fees are $2.00 per day or $10.00 per year. These are apparently access fees as it would not seem likely that a user fee would have been placed on public waters. The fees should not be confused with boat registration and do not revert back to the Wildlife Commission as one boater thought.

The Future

During the 1965 boating season a number of events took place which immediately affected boating or affected the future of boating. Newly enacted laws include the adoption of the Uniform Waterway Marker System, boat sanitation, etc., and are important to the over-all boating and water use program.

Then there was the interest aroused concerning boating accidents. In the long run, this interest will help make more people aware that there is a right and a wrong way to operate a boat. Questions, suggestions and planning and the above mentioned items pointed out some of the future needs for the boating program. All of this depends on one important factor which is of course the business of program financing.

A number of states have solved or greatly improved upon the problem by utilizing existing motorboat fuel tax. According to the Outboard Boating Club of America, 18 states are now using this money for boating programs at extra cost to no one.



Eastern Hognose Snake

by William M. Palmer and Franklin F. Snelson, Jr.

KNOWN in different sections of the State as spreading adder, cornfield adder, puff adder, and black adder, the eastern hognose snake, *Heterodon platyrhinos,* is one of the most unique of all harmless serpents. Hognose snakes are set apart from all other species occurring in the eastern United States by the presence of a flat, slightly upturned snout, a short, stocky body, and the characteristic habit of spreading the head and neck and hissing loudly when disturbed. General coloration is extremely variable, ranging from shades of brown, orange, and red, to entirely black. The pattern is typically present in the form of dark blotches along the back. In some specimens, however, these blotches are broken and fragmentary. The sides and belly are variously mottled and stippled with dark pigment, and the underside of the tail is noticeably lighter than the belly. Solid black or slate gray individuals, often lacking all traces of pattern, are rather common in some areas, and probably occur at least sporadically throughout the range of the species. Most adult specimens measure under 3 feet in length.

The range of the hognose snake encompasses most of the eastern United States and extends as far west as central Texas, Oklahoma, Kansas, and central Nebraska. Most examples from North Carolina have been collected from the Coastal Plain and the Piedmont, but reliable reports indicate the occurrence of the species in the Mountains up to elevations of almost 3000 feet.

The hognose snake is most often active during the day. Preferred habitats are open woods, in or about the borders of meadows and fields, and not infrequently about rural human habitations. As a general rule most specimens occur in areas of dry, sandy soil. Unlike many snakes, this species is more often found abroad than hidden beneath cover.

Mating usually occurs in the spring; the eggs are laid during the early summer, and hatching occurs in the late summer or early fall. The hognose snake is among the most prolific of all species, not uncommonly depositing three dozen or more eggs. Upon hatching in late August or September the young measure from six to eight inches.

Although there is little doubt that toads constitute the primary food, hognose snakes probably also consume frogs, insects, salamanders, and very rarely small mammals and birds. Captive prey is not constricted but is quickly swallowed, sometimes when still struggling.

When surprised in the field this completely harmless species presents a defensive display unrivaled by most of the venomous snakes of the world. The head and neck are flattened to more than twice the normal size, and this fearsome appearance is further exaggerated by the emission of a prolonged hiss. During such actions the snake may actually strike at its source of annoyance, *but always with the mouth closed.* If this behavior fails to frighten the intruder from the scene, the animal employs a different approach. Suddenly opening its mouth and wriggling the body in various contortions, the snake rolls over on its back and feigns death. While in this apparently lifeless position, the specimen can be handled, tied in knots, or tossed about without showing any evidence of life. However, if placed on its belly the snake will immediately roll over on its back, thereby foiling the bluff. If left unmolested for a short time, the hognose will slowly right itself and crawl away as rapidly as possible, only to quickly turn over on its back again at the slightest provocation. It is unfortunate that the average person, thoroughly convinced that he is faced with a very dangerous adversary, does not often witness this feigning of death. The snake is usually killed before the bluff has advanced to this final stage. Despite its seemingly hostile actions we have never observed a specimen attempt to bite, and we have handled many of them both in the field and in the laboratory.

READER SURVEY RESULTS

IN your August, 1965, issue of this magazine, you found a page headed "Reader Survey." We hope that you glanced at it and maybe helped us out by completing this questionnaire and returning it to us. It was designed to give us a better idea of what you like and don't like about the magazine. One mistake we made was not leaving a space for your comments on the questions or anything else you had on your mind.

And it had a few other things that could have been phrased a bit better; but be that as it may, we have analyzed the 676 returns received and hereby offer the results. We had no idea what to expect in the way of response, and realized that it would take some of your time and a five-cent stamp to send us the sheet. We were gratified by those that helped us and certainly send along our thanks. We hope that many of the suggestions offered will show up in the future issues of the magazine and that the total result of the survey will be a better publication.

We were a bit surprised that folks would take the time to make the comments that they did, aside from the answers to the specific questions. These comments were most helpful and ranged from a sentence or two to several paragraphs about various subjects. It shows that many of you are vitally interested in not only the magazine, "Wildlife in North Carolina", but basic conservation of our wildlife resources.

Although we knew this before we surveyed you, our readers, the questionnaire returns confirmed it: your interests are many, ranging from enjoying the glimpses of a cardinal in a backyard dogwood tree, to marlin fishing from a 40-foot cruiser. This means that some of you are rarely satisfied with the content of the magazine, while another group may be pleased with everything in every issue. Fortunately, the results indicated that the former group is much smaller than this latter segment of readers.

This information concerning preferences simply means that you can continue to expect a wide spectrum of subject matter between the covers—some perhaps on the fringe of "wildlife", but all oriented toward the enjoyment of natural resources of one kind or another. We realize full well that the bulk of our readers are hunters, fishermen, boaters, and, trappers; but these same individuals very likely have other interests (along with their families) in areas not directly related to their main sports. Perhaps you have questioned where swimming instruction fits into "wildlife", or snakes, or wild flowers, photography, or any of a dozen other "fringe" subjects.

Well, we can only say that of the 676 responses, 473 folks said that they read "everything" in the magazine. Yet we don't expect (although we'd like to be able to do it) to please everyone all the time.

Specifically (and we don't mean to bore you with figures) 643 of those responding said that they were subscribers and 550 were residents of North Carolina. This means that a high percentage of those returning the sheet were nonresidents. Very few, according to the results, registered a boat in North Carolina (80). It's a bit risky to project this figure into total readership (94,000) and come up with a number of boat-registering readers. The figure would be 10,340 if our arithmetic holds up. And certainly with a boating readership of anywhere near this, a fairly sizable chunk of the magazine should be devoted to boating.

Of the subjects we listed, the responders indicated that the "stories and articles I liked best" were, in order of numerical response, nature study, fishing, hunting, conservation, photo features, game management, where-to-go-fishing, snakes, camping, songbirds, where-to-go-hunting, fish management, law enforcement, and boating.

A high percentage of the returns indicated a desire for a "bigger" magazine, or at least more pages. You may have noticed that the last several issues have had 27 pages, instead of the old 23 and the October, '65 issue had 31 pages. The budget won't stretch much further than a standard 27 pages. We feel that the type is about right and very likely won't make it smaller simply to accommodate more copy.

Although less than half of the returns indicated a desire for inside color, we are going to try to have one or two middle-page spreads in full color in 1966. The covers are apparently well received, since a high percentage of you expressed a preference for both art work and photographs on the covers and that's how they will remain. It wasn't planned that way, but during 1965, we had six of each, photos and art work.

Very few folks thought that the articles were too technical, and perhaps we should have given you a chance to express an opinion as to whether you felt that they weren't technical enough. And even fewer of you thought the articles were too long. But several (although a tiny percentage) mentioned that you would prefer not having a piece continued to a back page. Well, so would we, but these may continue to crop up, so bear with us.

One thing that we're still not sure of, is the desirability of presenting "national issues." The figures were not quite conclusive enough here with 58 marking "too much national issues", and 143 wanting "more national issues." It is *Wildlife In North Carolina,* but there will be times when a country-wide issue will be offered for your consideration.

A vast percentage of the comments indicated satisfaction with the magazine as is (although some are still dismayed at how it can be produced for 50 cents a year) so changes will be minor but, we hope, meaningful.

Again, our thanks for guiding us in producing your magazine. ◆

DEPARTMENT OF LETTERS TO THE EDITORS, FIELD NOTES, AND ITEMS OF INTEREST

Conducted By Rod Amundson

There is no question in the minds of most people that Democracy is the best form of government ever instituted among men. But when Democracy develops to the point where Bureaucracy becomes dominant, Brother—hold on to your hat.

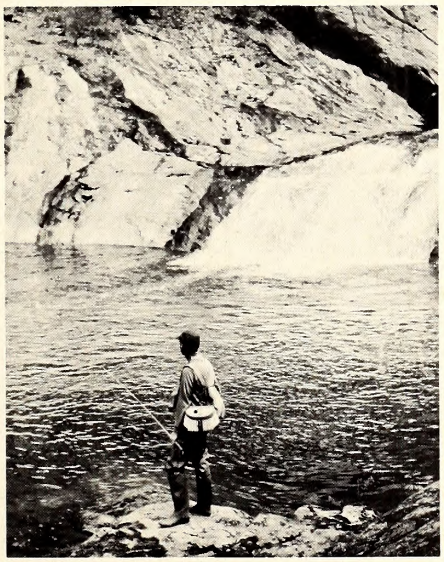
The national administration has taken a strong stand on beautifying America, cleaning up our polluted waters, preserving our wilderness areas, dressing up (or undressing?) our highways and so on. This is all very fine indeed. These are idealistic yet practical measures, and we should all get behind the movement and push. But which way should we push, and toward or against what?

While one government bureau is spending something like a million bucks an hour to store the greatest surplus of food the world has ever known, another is paying farmers to drain their land to produce more tillable soil for an even greater surplus of food for which more storage space must be rented.

How does this affect you and me as sportsmen? Well, a lot of this government subsidized draining goes on in the so-called duck factory country of Montana, Minnesota, and the Dakotas. Potholes and marshes are drained; and so is the supply of ducks for you and me to shoot at this fall. Meanwhile still another government bureau is fighting a running battle to get money to buy lands to flood for ducks to nest on so that we can maybe get more ducks down in our section of the country. This is a paradox, and I don't mean a pair of mallards.

But what is going on right here at home? For several years now there has been a little publicized but far-reaching controversy going on over some of the finest mountain trout fishing streams in the country. People living along these streams were persuaded the streams should be dammed at intervals to control flooding. These dams, of course, would impound nice clear mountain water, create beautiful, scenic mountain lakes around which real estate prices would soar at the prospect of summer mountain homes with built-in water recreational facilities.

Trout fishing interests realized that these dams would result in warming the water to the point where mountain trout could no longer exist, and many miles of excellent trout fishing would be



ruined. It appears that a solution has been reached. Dams will be built to control flooding, but the dams will have holes in them—at the bottom. In time of flood the basin will fill, but the hole in the bottom of the dam will allow that flood water to drain out at about the normal rate of the flow of the stream. This will result in flood control without spoiling the streams for trout fishing.

Thus far the inter-agency agreement is verbal, but let's hope it can be put on paper and properly put into action.

Along the vast coastal plains of Tarheelia, the picture is not so bright. The drainage people are at it again and have been for quite some time. Eastern Carolina swamps are a vital source of cypress, tupelo gum, and other valuable hardwoods. Some of the swamp water gets onto otherwise tillable soil, and therefore the swamps must be drained. What are a few thousand acres of priceless veneer-quality hardwoods compared to the prospect of raising a few bales of price-supported cotton or a few more bushels of subsidized corn or soybeans? And what about the ducks that used to live in these swamps, or the redfin pickerel and panfish that provided both food and pleasure?

All of these activities are carried on in the name of conservation. But the inevitable question arises: Conservation of what, and for whom? Someone said that conservationists who fight among themselves will win battles, but they will lose the war. All of these counter-conservational projects have to be paid for, of course, out of your pocket and mine.

But there is hope. All of the agencies involved with the natural resources involved in these projects have agreed to sit down and reason together before final project plans are drawn up. It looks like Democracy works after all, but it is not a self-propelled machine. We have got to make it work.

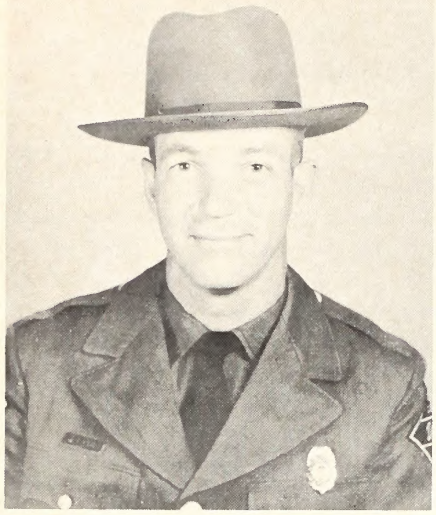
Gun-shy

DEAR SIRS: I have a Labrador retriever a little less than two years old. I have hoped to train him for duck hunting. He retrieves well and obeys satisfactorily, yet he is afraid of a gun. I have attempted to help him overcome this fear by placing the gun by his trough while feeding him. He has now become used to the gun itself—next step shooting the gun! Should I start out with a rifle? Could you please give me some advice for my problem? RICHARD BYRD, MONCURE

Hole Story

DEAR SIRS: I enjoy your magazine

KNOW YOUR PROTECTOR



Jerome Latif

Jerome Latif, Wildlife Protector stationed at Scotland Neck, was born in New York City in 1933. He is the son of Mr. and Mrs. James Latif of Goldsboro, North Carolina.

Prior to his employment with the Wildlife Commission, Jerry spent four years with the U. S. Navy serving in several duty stations around the world. He also served an enlistment with the U. S. Air Force after completion of Navy duty. He was engaged in the restaurant business with his father in Smithfield and Goldsboro just prior to employment with the Commission.

Jerry attended the Wildlife Protectors' Pre-service Training School at the Institute of Government at Chapel Hill in January, 1962, and went to work as Wildlife Protector stationed at Scotland Neck in February of that year.

He is active in community affairs and is Assistant Scout Master of Troop 57, a member of the Scotland Neck Lions Club and attends Trinity Episcopal Church. He is married to the former Dorothy Barbehenn of Irvington, New Jersey, and with their daughter Kathy they make their home near Scotland Neck.

DIVISION ENFORCEMENT RECORD FOR OCTOBER, 1965

HUNTING & FISHING	
Persons checked	31,437
Total prosecutions	769
Total convictions	750
Total cases not guilty	8
Total cases nol prossed	11
Total cases dismissed	0
Total fines collected	$6,218.35
Total costs collected	$5,939.90
BOATING	
Boats checked	903
Total prosecutions	36
Total convictions	36
Total cases not guilty	0
Total cases nol prossed	0
Total cases dismissed	0
Total fines collected	$ 123.00
Total costs collected	$ 322.65

All fines and any arrest or witness fees are paid into the school funds of the counties in which the violation occurred, and no part of the fines or costs collected are paid to the North Carolina Wildlife Resources Commission or its personnel.

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each month, especially those dealing with conservation and propagation.

In recent months you have run articles about building nesting houses for various birds, but in every case you fail to mention the size opening that should be cut. Isn't this of importance? I'd like to build a few bluebird houses but the starlings take over almost every bird box I put up. JOHN C. DOWNING, FAYETTEVILLE

The entrance diameter most recommended for bluebirds is 1½".—Ed.

Dog Race

DEAR SIRS: In reference to the letter in Crackshots and Backlashes, September issue, by Mr. K. V. Privett, Jr. of Charlotte, I would like to make a few comments.

First of all, I don't think you classified free-running dogs and people who run dogs during closed season in the same class as does Mr. Privett.

I am an avid beagler and run beagles at field trials all during the year. At these field trials I meet the best sportsmen and gentlemen I ever have the pleasure of knowing. These are not so-called sportsmen who will go out and kill 25 or 30 rabbits in a single day, as will most gunners if they get the chance but men who will follow their dogs all day at all times. We follow the dogs for the joy of seeing the little beagle work and not to see a kill made. When a bunny is killed, the race is over; so therefore every effort is made to keep this from happening by picking up the dogs before the rabbit is rundown.

I say a man can run his dogs during closed season and still be a sportsman and not a hypocrite as Mr. Privett suggested. MELVIN L. OUTEN, MONROE

Correction

H. A. Schmidt, Manager of the Southport Harbor called to our attention some corrections that should be made in the article in our October issue about this small craft harbor. The facility offers berthing space for 110 boats up to **125** feet in length (not 25 feet as stated in the article); and the harbor channel leading to the docks is 8 feet at mean low water not 12 feet). The Harbor's address is P. O. Box 578, Southport, rather than 577.

Bluebird Day

DEAR SIRS: I have been reading **Wildlife** five years and find it a most worthwhile magazine. Keep it up. I have the October number and see what you have said about PROJECT BLUEBIRD and am glad to know that you are doing something about it in the Old North State. I want to know how one can keep snakes from eating the little birds. I have only one pair of bluebirds that have been nesting in my yard now for three years. This past summer snakes killed all of the young birds, two settings. And then I found a snake in another box where there were no birds.

You will recall that five years ago the "Reader's Digest" came out with an article on SAVE THE BLUEBIRDS, giving the measurements for the boxes. I followed these directions and made boxes, but at the same time I put up gourds, and no birds would nest in the boxes. Georgia bluebirds like gourds better. A. H. MILLER, ATHENS, GEORGIA

How About Tuesday?

DEAR SIRS: At the Town Council meeting this coming Monday a request will be made that the council take immediate steps to rid our downtown area of its increasing pigeon nuisance. And we want to know how.

The pests used to call the old courthouse building home, but when that was demolished, they moved to other multi-storied buildings and just recently have centered their roosting activities on the new million dollar courthouse. The copper roof is becoming badly stained. The Main street sidewalk is littered with droppings.

We have strung owl decoys atop half-dozen buildings, including the courthouse, but the pigeons just buddy-up to the owls like they were long-lost millionaire uncles.

Someone suggested shooting them, but the town fathers are going to be extremely reluctant to turning the wildlife club loose with shotguns in the heart of the business district. The county has already purchased and used some sort of liquid which was supposed to be a pigeon repellant, but it didn't work. Poison grain was suggested, but I'm afraid the council will reject that one on the basis that some old lady's cat may eat one of the dead birds and pass on to its reward.

If you have any suggestions or recommend anyone who may come up with a solution before Monday night's meeting, I'd certainly like to know about it. MABREY BASS, JR., EDITOR OF THE DAILY SOUTHERNER, TARBORO

Canada Goose Engraving To Decorate "North Carolina Gun"

The first collection of hand-worked rifles and shotguns ever produced to commemorate all 50 states of the Union will be made up exclusively of Winchester firearms.

Titled the "American 50," the national commemorative series will consist of 501 guns: ten for each state and one for the District of Columbia. Every gun's receiver will be embellished with hand-engraving and a game bird or animal emblematic of the particular state will be artistically carved by hand in the stock. The series, when completed, will represent four years of work by a New England master craftsman.

The Canada goose has been selected as the game species emblematic of North Carolina. Its likeness will be engraved upon 10 Winchester Model 1400, 12 gauge automatics.

The receiver of each gun will be decorated with hand-engraved scroll work surrounding an American eagle hovering about the "American 50" series identification. In addition, each state series bears the name of the state, the date it entered the Union and a special serial number from 01 through 10. Each gun will be permanently recorded in the buyer's name and accompanied by a certificate of authenticity.

Engraving and stock-carving will not be the only distinguishing characteristics of the American 50 guns. Stocks of fancy grade wood will be fitted to the Winchester barreled actions by a noted stockmaker, Reinhart Fajen of Warsaw, Missouri. All actions will be hand-stoned for ultimate smoothness and barrels customized in lustrous blue-black finish by Wally McCloud of Shelburne Falls, Massachusetts.

Additional literature and information can be obtained by writing Mr. Bob Kain, c/o American 50, Newfane, Vermont. ⬍

YOUTH

• **continued from page 8**

tion curricula if the demand were sufficient.

Outdoor education in the nation's schools is not something completely new and untried. Right now, about 1000 school districts over the country offer one-week "outdoor schools" as a part of the regular program. Other schools have "hunting and fishing" clubs and general outdoor clubs. Michigan State University has maintained an outdoor-education project for ten years under the joint sponsorship of the American Association for Health, Physical Education and Recreation and the American Fishing Tackle Manufacturers Association. Through the work of Julian W. Smith, director of the project, the university has gained a tremendous amount of knowledge concerning the best methods and techniques for presenting the out-of-doors to students.

The die has been cast and the trail blazed. All that's required now is public awareness of the need, and the advantages, of outdoor education in the schools and action by school officials under a government-sponsored program. Sportsmen can help activate this program in a number of ways. Once legislation is introduced, individual sportsmen and sportsmen's clubs can let their Congressmen know their feelings in no uncertain terms. And if and when such federal enabling legislation is enacted, they can make their influence felt at the state and local levels too.

The sooner we accomplish our purpose, the sooner the boys and girls of these United States will know, and benefit from, the blessings offered by the out-of-doors.

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Help Conserve Game
REPORT VIOLATIONS

To report a violation of the game laws, call North Carolina Wildlife Resources Commission at one of the following locations:

Location	Area Code	Telephone
Edenton	919	482-2895
Washington	919	946-4744
Burgaw	919	259-4423
Rocky Mount	919	GI 2-4745
Fuquay-Varina	919	552-5028
Elizabethtown	919	862-3826
Burlington	919	228-8523
China Grove - Landis	704	857-9188
Pinebluff	919	281-3568
N. Wilkesboro	919	838-4618
Valdese	704	437-3215
Marion	704	697-7311
Waynesville	704	GL 6-9292
Raleigh	919	829-7191

A Commission radio operator will take your message and immediately relay the information by radio to the nearest wildlife protector. If a long distance call is necessary to reach one of these numbers, place the call collect, and inform the operator that you wish to report a game law violation. If you fail to reach the first number called, try the next nearest location. If you do not have these numbers available, call your Sheriff's or Police Department office.

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Wildlife IN NORTH CAROLINA

FEBRUARY, 1966

JOEL ARRINGTON

Winter Resident

The experts can tell this Carolina chickadee from a black-capped by its shorter tail and lack of white-margined wing coverts. They stay all winter, helping to break the cold drabness.

STATE OF NORTH CAROLINA

DAN K. MOORE
GOVERNOR

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WILDLIFE RESOURCES COMMISSION

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WILDLIFE IN NORTH CAROLINA recognizes the need for close cooperation between State and Federal conservation agencies and the people who hunt and fish—to bring about a restoration of our renewable resources. The Editor gratefully receives for publication news items, articles, and photographs dealing with the North Carolina out-of-doors, but reserves the right to reject materials submitted. Full credit is given for all materials published.

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FEBRUARY, 1966 VOL. XXX, NO. 2

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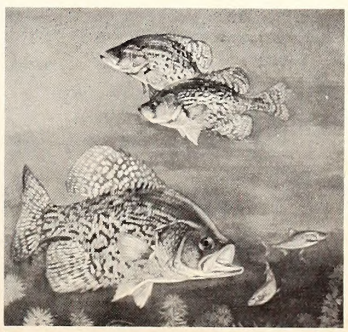


Although most fish aren't as active during the winter as they are in the warmer months, the black crappie is one that continues to feed and move about a bit. One of the trio on this month's cover is (he hopes) about to make a meal of a golden shiner. Minnows are fine bait for this winter fish, but must be fished deep and rather slowly. Color of the black crappies varies greatly. Painting by Duane Raver.

Tips on LATE SEASON QUAIL

by Frank Mooney

LUTHER PARTIN

LATE in the season it takes more steps, more shots, and some nimble thinking to put meat in the bag. The twilight of the season calls for a change in tactics. Bobwhite quail, whether hunted or not, become wily and invariably on the alert. And the hunted birds lose their patience quicker than the unhunted. Some coveys that held tight in early fall will flush beyond gun range in late season from the sound of a voice, loud noises or even the sight of a hunter. The direction from which you approach a feral covey has an important bearing on their tendency to hold.

Several years back, I had my own special covey. I must have been the only hunter that had discovered their range, for in late season jaunts when my day had been fruitless, I would jubilantly think of that covey. I never dared shoot into the covey more than once a week, thus hoping it would not drive them from their home range. Birds, if hunted hard, will abandon their range.

The birds in question always held well for the dog, invariably flying in one of two directions. They always flew in those directions no matter how hard I tried to disperse them.

ONE afternoon, while taking an excursion on my favorite covey's home range, I reached the fringe, and my dog slid into a rigid point on a nearby bank. Never before had I found birds on the other side of this road. Wondering if they would cross, I stepped around the covey so that they were then between the road and me. The birds were reluctant to flush until I stepped closer, entering a small patch of honeysuckles. Suddenly the vegetation exploded as I gingerly moved in. Dropping two with the first shot, all I got with the second was falling bark and limbs. The singles cleared the woods, turned sharply to the right at the road's edge and flitted to their usual place.

My setter tried to retrieve both birds at one time before deciding to split his task into two trips. Enjoying all the flattery, he contemplated the singles. As we neared a power line right-of-way, a single catapulted up. I shot just as the bird cleared an opening and feathers flew as the bird pitched downward. Across the right-of-way the dog pinned down two more singles. Just as one leveled off I fired and was still firing when they disappeared over the ridge.

Late season birds persistently run out of the field, flushing once they reach the safety of the woods. After watching a dog and hunting with him one can tell by his actions when the birds are running. It's best to keep a steady pace, trying to be within gun range when the birds flush. Quite often it's rewarding when hunting a field to start from the woods. Birds are giddy when approached this way and late season birds, being unstable, usually hold in this manner until flushed.

It's essential to keep the dog beside you when moving up, for many hunters walk past birds before they are flushed. When pinned this way birds generally come up in a swirl thus coming back over the hunter's head making for mean shooting. But at least they are usually within your shooting range.

When I first started bird hunting the thought never occurred to me that I should make them fly a certain way; my only concern was shooting. My uncle showed me that by planning the birds flight, I could save time, walk less, and have better shooting. This is not always true but the percentages are most definitely in your favor. Many steps can be saved by flushing birds the intended way, and you are able to enjoy better shooting when you push birds to open terrain.

Some people are skeptical when I state that quail fly to roost in the evening and from their roost in the morning to their feeding ground. I don't mean all birds, but generally speaking, the majority seem to. For example, a large covey close

Both dog and hunters are rarin' to go at the start of a late-season quail hunt. Birds will very likely react differently during February than they did at the season's beginning. You may be indeed fortunate to find quail holding like this (below) after being shot over so much.

to home would flush wild and singles were almost impossible to find. After flushing the covey about dark one evening I decided to see if I could call them. After cautiously returning to where they had previously flushed, I hid quickly in some dense pines. About sundown I whistled three times and almost instantly two birds answered some 200 yards to my right.

I whistled softly again, and within a few seconds I glimpsed several birds running on the ground, towards the corn field approximately 50 yards to my left. The rest merged at the field and commenced feeding on scattered corn. After feeding several minutes in the open field they flew up as if by prearranged signal, crossed a road and landed in a lespedeza field to roost. The birds must have learned that by flying to roost animals are unable to trail them.

I discourage the use of a young, unstable dog on late season birds, but at this particular time I couldn't do better. After parking my station wagon near an old tobacco barn I let my eight-month old English setter out and shouldered my gun. This was old hunting territory for me but new for the dog. The setter cavorted a little and then settled down to the business at hand. She would point any fresh scent, so I wasn't concerned when she struck. After crawling for a few yards she froze near a small thicket and I eased up to her in the dry leaves. No sooner had I stepped past the dog than the birds started running in the brush.

I managed to knock one down as they cleared the undergrowth which was really too thick for seeing the birds. Since I knew birds range where their life needs are centered unless they are molested constantly or unless food and cover gets scarce, I headed that way. Learning a covey's range saves lots of walking and a great deal of time. Cutting to the left of where they usually go, I found I could push them toward the open field and also go below another covey's range.

The dog pointed a couple of times but moved on; I assumed I had missed when the other bunch of 15 or 20 birds spiraled across the creek. After I snapped off a couple of fast shots and downed one bird, the dog came in and pointed my cripple as the singles flew in the direction from which I had come. They consistently fly down the bottom even with me on the opposite bank of the stream and let me pass before they fly.

After cutting across a freshly plowed field, a pasture and another plowed field, I was planning to get below and intercept them. As I entered the woods a dozen or so birds flushed wild from some honeysuckles, out of gun range. Thinking these were the ones for which I was looking I walked on, assuming the largest portion of the covey would

stay together. As I reached the spot I knew instantly that these were different birds and they were scratching everywhere.

Starting back up the creek hoping to see some singles, I crossed a fence and hadn't gone over 50 yards before a hen flushed behind me. Turning quickly I squeezed the trigger and dropped her beyond the creek.

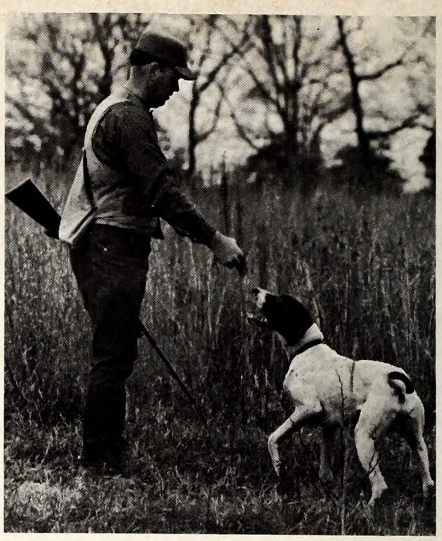
That was all of the second covey so I crossed the dirt road to the spot where the first covey should be. Flushing ahead of the dog, the birds flew up the bottom. As I neared the field one got up and headed back in the direction from which he had just flown. At the sound of the gun the bird piled into a bush and another flew from a tree as the sound echoed down the bottom.

When a single flies over another sticking on the ground, the sticking bird will usually follow suit. It was near the place we first started when the dog trailed a few yards and stiffened in a weed field. As I moved in, she gingerly crawled to the edge, pointing again, allowing me to take a couple of steps before four birds exploded up and flew around some dwarf pines. I swung on one, shooting as it disappeared around a pine. The feathers drifting back told the story as the setter rushed in and found the dead bird.

Hunters talk a lot about the birds changing in past years. An uncle of mine who hunted 50 years ago says that some birds lit in trees and got up wild. Late season birds can become a problem if not pursued correctly. A hunter friend of mine related a jaunt he took late one afternoon and went on to tell how a covey of 14 birds flushed wild ahead of the dogs. Flying parallel to him, they gave him time to make count and all 14 stayed together during flight. Eight landed around a cedar with six in the trees. My friend signaled for his companion to circle the tree. Coming from opposite sides they closed in getting only hasty shots as the birds flew before the hunters were in shooting position.

If the birds had not adjusted to our modern age it would have been almost impossible for them to survive. Too many hunters with civilization closing in, feral dogs and cats, all are helping to cut them down.

My uncle Dave Chandler, Gene Hart and I were hunting late in the season one cold and windy day when all birds were either running or flying beyond range, thus giving the dogs the once over. There had been several times that morning when the dogs had trailed and pointed, and moved up as the scent gave out. We kept going the way in which the birds were traveling and crossed a broomsedge section before entering a lespedeza field. There the setter hit a fresh scent and froze as the pointer backed. We had moved up 30 yards or more before the birds had flushed. They were running and getting up at maximum range; however, we were able to drop one on the rise.



Bird hunting over a good dog has rewards other than the downed quail. But we all like to come home with a little to show for the trip. The bird in the hand during the tag-end of the season takes a bit more skill and perhaps tactics that are considerably different from those used earlier in the year.

As we neared the starting place, I noticed a large covey fly up ahead of the dogs. The birds were between us and some houses so we hurried trying to get between the houses and the birds. As we neared the birds, one dog was sliding into a point. We waded in expecting birds to get up everywhere. But nothing happened. I was about to ask where could they be when one spiraled to my right. As he fell two more exploded near the same place and these too were downed. The rest must have hit running for several birds skimmed over a fence 60 yards away giving no chance to shoot. Some had run across a small corn field and had flown toward a house thus depriving me of an end-of-the-season shot. The rest just evaporated — couldn't find a feather!

Late season quail are uncanny! They'll leave you giddy at times but can provide a real challenge that can leave you enchanted when you most deserve it.

Trout Stream Report

DURING its Clearwater, Florida, meeting in the fall of 1964, the Southeastern Section of the Wildlife Society heard a report from its Subcommittee on Trout Streams. The Committee toured portions of Georgia, North Carolina, and Tennessee to observe and compare damage to trout streams in recognized problem areas with relatively undamaged ones. This is their report.

OUR definition of a trout stream is a flowing, dynamic, stream system, including all tributaries, which sustains a resident population of trout within its boundaries and is limited at the downstream end only by temperatures exceeding the lethal limits of any trout species. Your subcommittee believes that trout streams in the southern Appalachian Mountains represent a unique and nonrenewable resource of tremendous value within the over-all forest complex and that encroachment by various "special use" interests appears to be gaining ground at an alarming rate. The subcommittee feels that it is past time for an evaluation of these streams with respect to their worth as a part of the over-all forest complex and as a recreation resource in their own right. And we charge that the recreation benefits provided by these streams must be considered at the top of the ladder in any enumeration of quality recreation.

Due to (we hope) a gross underestimate of the recreational value of this resource, the headlong plunge of some agencies to spread their programs of impoundments and access for various purposes, along with special interest users, is gobbling up and destroying trout water at an alarming rate. If there is to be hope of preserving this valuable resource, the following problems must be resolved.

First are the physical problems including both new and old surface disturbances within the watershed. Those having the most detrimental effect are agriculture, road building, logging, mining, fire, vegetal changes, grazing, construction of impoundments and channelization, and development and settlement. Secondly, biochemical problems associated with management including pollution, both organic and inorganic, intrusion of undesirable fish species and low nutrient levels in the water (perhaps an indictment of past watershed management), beg for attention. Resource use problems must also be considered including examination of fishing pressures imbalance, pressure from commercial interests, whether or not there is a need for access, and an assessment of the quality of recreation derived from use of these streams, as well as the amount of use now and in the future.

In answer to these problems, the committee recommends a program of inventory and research designed to gain recognition of the value of this trout stream resource by administrators. If we are to protect what remains, a survey must be conducted to inventory all such streams, within the Section boundary, on the basis of the following five categories:

1. Number of miles of tributaries or feeder streams which contribute flow to mainstem stream.
2. Number of miles of mainstem streams in which native reared fish are found.
3. Number of miles of catch-out waters where natural production may not occur but where physical characteristics are such that the stream is utiilzed in the stage fisheries program for a put-and-take fishery.
4. Number of square miles of watershed encompassing these trout streams by type of ownership.
5. An estimate of present fishing pressure and the growth increment of this pressure during the last ten years.

Once compiled, these data will provide reliable information on the type and size of the resource and the problem—both of these are now lacking.

The committee further recommends that member organizations give immediate attention to the following needs with special consideration to research needed for effective, balanced administration of this resource.

- The development of methods to determine the economic and esthetic contributions of trout streams.
- The determination of minimum standards for highways to satisfy scenic and other recreational travel requirements.
- Encourage studies to develop methods of minimizing disturbances during logging operations, including, but not limited to, cutting methods and road placement. Support research of silvical systems designed to reduce soil water losses.
- Review and re-evaluate special interest uses on public lands, particularly those

• continued on page 30

An Improved Gray Squirrel Nest Box

by F. S. Barkalow, Jr.
and R. F. Soots, Jr.
N. C. State University at Raleigh

This is reprinted from the Journal of Wildlife Management, Vol. 29, no. 4. It could mean more squirrels.

THE value of employing nest boxes as an investigational tool in squirrel studies has been recognized for many years, but few systematic attempts to improve the effectiveness of the box itself appear to have been made. The box should attract maximum squirrel use, require little maintenance, exclude predators, facilitate rapid examination, permit capture of all occupants quickly and without injury, be inexpensive and of simple design. The box shown in Fig. 1 has proven quite satisfactory in meeting most of the above criteria, and 410 of these boxes are being used in our current studies of the gray squirrel, *Sciurus c. carolinensis* Gmelin.

The present design resulted from the experience gained during three previous studies (Bunn 1942, Allison 1953, and Harris 1958) in which 499 boxes were used. Bunn tested 50 boxes of several types. Allison, drawing upon Bunn's experience and that of Brown and Yeager (1945) and Hesselschwerdt (1942), erected 18 boxes of varying sizes and designs on a study area near the N. C. State Campus. The condition of Allison's boxes and their usage by gray squirrels were recorded over a six-year period (Nov. 1949-Nov. 1955). During the spring of 1956 Harris, using Allison's most successful design, erected 400 untreated pine boxes on two plots of approximately 200 acres each within the William B. Umstead and Reedy Creek State Parks near Raleigh, N. C. The boxes were checked quarterly and maintained until May 1960 when all were taken down except those containing gray squirrel litters. The boxes remaining were removed by September 1960. Twenty-five boxes which had either rotted, been destroyed by wind, falling limbs, or lightning had to be replaced before the end of the four-year period. Of the remaining 375 boxes, less than ten percent would have provided shelter for squirrels through another year.

AS a result of these experiments with different kinds of boxes, it was discovered that a box which was securely fastened to a tree was time consuming to check and difficult to repair, whereas a detachable one could be examined quickly and repaired easily when brought to the ground. The time required to evict a squirrel at night (Fig. 3) from the new box proved to be a only a fraction of that necessary to dislodge one from a nondetachable box. Both day and night examinations were found to be necessary to obtain a reasonably accurate measure of box utilization by gray squirrels. The percentage of squirrels escaping during a check was reduced significantly when detachable boxes were employed (Table 1).

The box illustrated in Fig. 1 was constructed of 1" rough sawed, heart cypress boards fastened together with zinc coated, 8d box nails. The hanger was attached to the batten strip by coated 6d box nails driven through the hanger and strip and bent across the grain of the batten. The batten, with hanger, was fastened to the side of the box with five,

Table 1. Comparison of capture—escape data between old permanently attached and new detachable den boxes.

Type	Dates	Boxes Checked	Squirrels Captured	Number Escaping*	% Escaping
Attached (Harris 1958)	Sep. 56-Sep. 60	6,606	747	141	15.9
Detachable	Nov. 62-Dec. 64	3,503	391	18	4.4

*Includes animals leaving box before being reached by climber as well as those escaping while being dislodged from box or being handled. All unweaned young excluded from above tabulation.

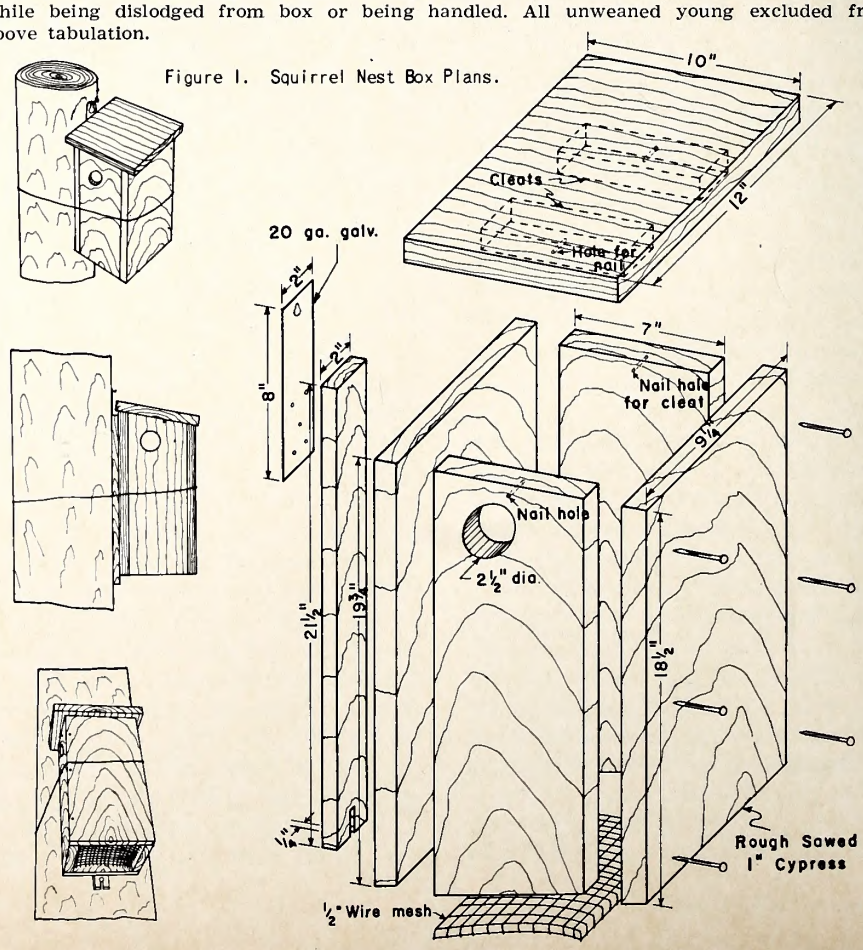


Figure 1. Squirrel Nest Box Plans.

1. Sponsored by the North Carolina Wildlife Resources Commission, PR Project W-44-R, "An evaluation of squirrel nest boxes on selected experimental areas" and the National Science Foundation, Grant G-20739, "Population phenomena of *Sciurus c. carolinensis*."

Above, a winter nest box check is made. The hole has been plugged with a leaf-filled sock. At right, a sack is readied.

Fig. 2, the soft muslin sack is slipped between the upper part of the box and lid (below). Above, out comes the squirrel!

6d galvanized nails driven through the batten and well into but not through the side of the box. The 6d nails have proven sufficient to hold the box firmly to the batten strip under ordinary use but permit the box to be dislodged without serious damage when knocked from its moorings by falling limbs on trees during ice and windstorms.

Boxes which had been firmly attached by lag bolts were usually shattered beyond repair under similar circumstances. The nest box was suspended by two, 20d to 40d zinc coated nails with at least 1" clearance left between the nail head and the top and bottom of the batten strip to allow for tree growth. The box was prevented from rocking by a single strand of #10 solid, polyethlene covered, THW conductor wire pulled taut and the ends twisted together (Fig. 1). The wire was sufficiently rigid to hold the box in place without unwinding as a result of wind action; yet it would untwist or slip with tree growth or when being knocked from the tree.

The 2½" diameter, circular entrance was apparently effective in excluding small opossums, *Didelphis m. virginiana* Kerr, for none has been found in the new boxes. In Harris' boxes with a 2½" square opening, young opossums were found on a number of occasions. A leaf-filled sock (Fig. 2) made a very efficient plug for the round opening, whereas the square entrance was difficult to close. The 2½" circular opening excluded most potential predators on our area. The 14" depth of the box below the entrance hole generally insured the location of the nest cavity to be beyond the reach of both the raccoon, *Procyon l. lotor* (Linnaeus), and opossum.

Circumstantial evidence implicates the raccoon as an important gray squirrel predator on the study areas. Throughout the investigation raccoon populations were high, and the species proved to be a nuisance during the live trapping phases. It was not unusual to have 30 to 40 percent of the 200 traps turned over in a single night by raccoons trying to get the shelled corn bait. On a few occasions gray squirrels which were caught after the traps had been run in the afternoon appeared to have been removed from the traps during the night by raccoons. In two instances raccoon hairs were found around the opening of the nest boxes from which a part of the nest material had been pulled.

In other cases in which the nesting material had been disturbed, the species responsible could not be positively identified although the raccoon was suspected. In every case in which the nest was disturbed, the box was of the Harris design and had been erected with the entrance hole next to the tree. During the summer checks, leaf nests were occasionally found which had been torn into by what appeared to have been a raccoon. Twelve raccoons were found lying on squirrel nests. Since several aspects of our study would have been adversely affected by a removal of the raccoons from the population, it was not possible to examine their stomachs for evidence of predation. Data which indicated a greater survival rate of summer nest box litters compared to the summer leaf nest litters from the same areas was discussed in our paper dealing with the effect of artificial nest boxes on squirrel populations (Barkalow and Soots, 1965).

One small opossum was found in each of six Harris boxes during the first 6,606 individual box checks, but none have been recovered from the new boxes (in 3,503 checks). Screech Owls,

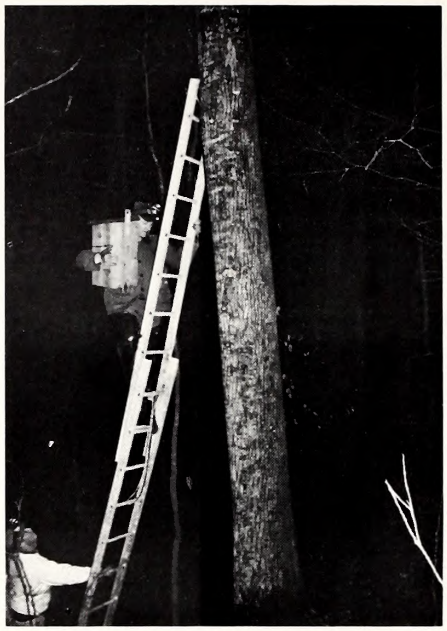
Otus asio, were found in 20 boxes (including both the old and new designs) during 10,109 box examinations, but no evidence of their predation on gray squirrels was observed.

Of the six black rat snakes, *Elaphe o. obsoleta,* found in nest boxes, one contained two nestling gray squirrels 5½ weeks old; one had eaten 11 bobwhite quail, *Colinus virginianus,* eggs. Four snakes whose stomachs appeared to be empty were released unharmed.

Box utilization by gray squirrels and other vertebrates varied greatly from season to season, and this pattern of occupancy will be reported upon in detail in a later paper.

A sloping roof with an overhang on all sides reduced the problem of water seeping into the box or standing on the top. If heart cypress is used, the cleats may be fastened parallel to the grain of the top, and the pin which is inserted through the sides of the box and into the cleat holes is usually sufficient to prevent the top from warping and to fasten it securely to the front and back of the box. If the top has a tendency to warp badly, the cleats must be fastened at right angles to the grain, in which case the expansion and contraction will sometimes work the cleat nails loose.

The bottom was constructed of ½" x ½" hardware cloth, galvanized-after-welding, 14 gauge iron wire ("Perma Gard" by Gilbert and Bennett Mfg. Co.) bent on a pan (finger) brake to form a wire basket 7" x 7" x ½". The wire tray was fastened in an inverted position with galvanized staples on four sides about ½" from the bottom. The mesh was small enough to prevent raccoons and other predators from removing the nesting material from below and yet of sufficient size to allow the disintegrating leaves to sift out and to permit rapid drying should the nest become wet. A layer of dry leaves, about 1" thick was placed in the bottom of each box at the time of erection. The lighter gauge of woven wire should not be used for the bottom since raccoons can gain easy access to the nest contents by simply forcing the strands apart.



A nest box is brought to the ground for examination during a night check. At right, the squirrel is removed. Special leather gloves provide protection from the animal's claws.

GRAY squirrels were found to occupy a wide size range of artificial dens, the smallest observed being a bluebird, *Sialia s. sialis* (Linnaeus), box which was taken over by a near-term female. The inside dimensions of the bird box were 4" wide x 5½" deep x 7" high. The squirrel enlarged the original 1½" circular entrance into a horizontal ellipse approimately 2" x 2½". The maximum size den which gray squirrels will use was not determined, but wood duck, *Aix sponsa* (Linnaeus), boxes with inside measurements of 10" x 10" x 23" were occupied whenever squirrels could gain access to them. Observations of the nests built in Harris' boxes seemed to indicate that the inside dimensions (8" x 8" x 18") of his box could probably be reduced without adversely affecting gray squirrel occupancy. The new box was designed with inside measurements of 7" x 7" x 17½".

Since observations by Allison and Harris indicated that heights above 10' from the ground appeared to be of minor consequence in influencing gray squirrel occupancy, the new nest boxes were erected between 10' and 25' to reduce the climbing hazard for our personnel and the time required for examination.

A 20' magnesium alloy extension ladder was employed to reach the boxes. A leaf-filled sock was used to plug the entrance. If a box was occupied by one or more gray squirrels, the stabilizing wire was loosened, and the box lifted from the nail supports and carried to the ground. The box was placed in an upright position on the ground, and the two securing pins were removed from the top which was quickly inverted. A soft unbleached muslin bag was then slipped between the top and the upper end of the box as shown in Fig. 2. With the sack held securely in position, the box was placed on its side, a dowel rod inserted through the wire mesh bottom, and the occupant prodded gently from the box into the bag. Since the box is placed on its side to dislodge the occupants, the danger of injury to young nestlings is lessened considerably.

When several squirrels ran into the sack, all but one was al-

Squirrels are frequently reluctant to leave their den boxes even though the boxes have been brought to the ground and most of the nest removed. This one did not leave the box until it was almost entirely uncovered.

lowed to return to the box, the box being raised to an upright position and the top, with cleat side up, being placed over the upper end of the box. With the squirrel restricted to the bottom of the bag (Fig. 3), the mouth of the sack could be slipped from beneath the top and from around the box. The sack was twisted to close the opening and reduce the diameter of the bag. By holding the mouth of the sack closed with the right hand, the squirrel could be maneuvered into the constricted portion by pointing the constricted end away from the handler. Almost invariably the squirrel would run to the twisted end where it could be grasped by the left hand firmly but gently around its shoulders and neck. With the animal securely held, the sack could then be folded away from the squirrel, allowing it to be examined and tagged.

Although the box was designed to permit the greatest facility for the capture and examination of squirrels, it appears to be adaptable for management on a large scale. The cost of materials and construction for the 410 heart cypress boxes of the new design was just under $2.25 each. The cost of a pentachlorophenol treated pine box is approximately the same as one constructed of untreated heart cypress. If boxes are to be used as a management practice, they should be constructed of heart cypress or treated pine since our data indicate that the period of usefulness of an untreated pine box rarely exceeds four years under local climatic conditions. None of our new boxes or those erected under the North Carolina Wildlife Resources Commission's state-wide squirrel box program has been up long enough to give an indication of the average useful life of treated pine or heart cypress boxes.

Wood-using agencies employ a figure of 20 years as a guide for the average effective life of 1" treated pine or sound heart cypress when used above ground. Observations made of a few cypress wood duck boxes ten years old indicate that barring accidents and vandalism, heart cypress boxes may reasonably be expected to last from 15 to 25 years. During the summer of 1951, six new pine boxes of Allison's most successful design were treated with pentachlorophenol in an oil carrier and given to cooperators who reported all used by gray squirrels within the first year. The one box on which data are available has been occupied by squirrels every year since its erection on 30 October 1951. The box was examined on 16 November 1964 and found to be in use and in good condition. No deterring effect to squirrel occupancy resulting from the treatment has been observed.

If the boxes are used on areas open to hunting, it is essential that they be located in large trees high enough from the ground to discourage human interference and vandalism. Placing the box on the main stem of the tree and above or within a cluster of limbs will provide additional protection from shot for both the box and its occupants. Particular care should be taken not to allow the box to rest on a limb since wind action will either cause the box to be dislocated or the limb will callous at the point of contact, eventually splitting the box.

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Pine Timber Rabbits

by Grady L. Barnes
Refuge Supervisor

F. EUGENE HESTER

WILDLIFERS have often termed pine timber lands as "biological deserts"—areas void of wildlife. During a period of its development, a pine stand produces no food and no cover near the ground and since all wildlife is dependent upon both food and cover there is a period during the life of a pine stand when it really does approach a desert condition. However, in many parts of eastern North Carolina young pine plantations are interspersed with croplands, creating conditions which induce rabbit population explosions.

In these coastal plain farming regions timber and pulpwood companies have bought small tracts of farmland that are still interspersed with private farmland. As these tracts are planted to pine trees a rank growth of grass and weeds invades the young pines and results in a dense stand of preferred cover for rabbits. Farm fields adjacent to young pine plantations are usually seeded to soybeans or small grains which provide an abundant supply of food.

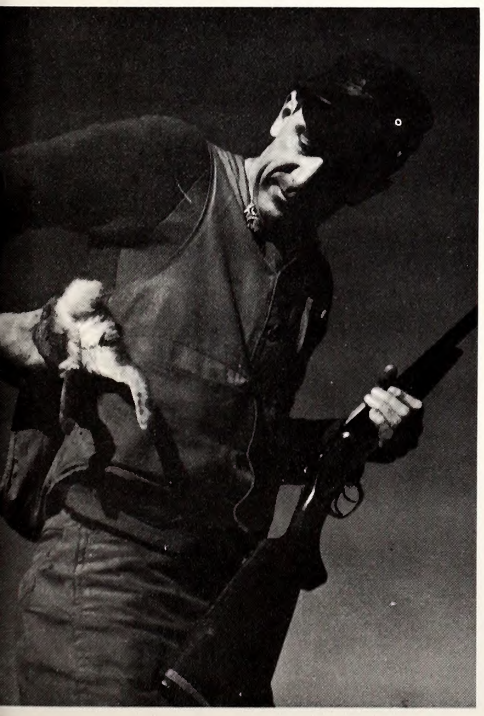
This combination, an abundant supply of food and dense escape cover, results in ideal conditions where the normally prolific rabbit is able to produce several families of young each year. An unusually high proportion of these young are able to survive because they are protected in the dense cover created by the pine plantation. The evergreen pines produce a canopy that reduces predation by flying predators and the dense growth of weeds produced by the fertile soil reduces predation by ground predators. However these conditions of ideal cover usually last only until the pines are about six to ten years old; at this age forestry practices, such as controlled burning, reduces the ground cover and the utilization of the area by rabbits declines until the stand reaches an age of 15 to 20 years. At this age, harvest thinnings are initiated and opening of the canopy and development of honeysuckle thickets results in some improvement of conditions for rabbits — but nothing to match the first six to ten years.

Product of the Soil

Rabbits, as is true with all wildlife, are a product of the soil and the resulting plant life. In areas of fertile soil, rabbits are more numerous and usually a few ounces larger because of better food. In these eastern North Carolina farmland sections the soil is normally fertile and high in organic material. This combination produces an abundant crop of plants which are high in nutrients. In addition, farm crops that are fertilized heavily with commercial fertilizers are exceptionally high in nutritional value and produce high quality rabbit food. Combine this food with winter cover produced by pine plantations and you have rabbits and more rabbits.

Hunting these areas has very little effect on the total rabbit population. As long as food and cover exist in the right combination the rabbits are able to maintain their numbers. The natural annual mortality rate of the rab-

Solid stands of mature pines do not make good game habitat. Small fields of food-producing crops interspersed with the plots of growing trees create rabbit country. More "edges" put more rabbits in bag.



bit populations is about 60 to 70 per cent. This means that if a fall rabbit population of 100 is reduced to 40 rabbits by late winter, the population will again reach 100 rabbits by the next fall in good habitat.

In pine plantation areas where the rabbit population has declined it is usually due to a reduction of either food or cover or both. In some cases the pines have grown to a height that the canopy closes and shades out the plants that produce the ground cover. The same amount of food may be available in surrounding fields, but there is no place for the rabbits to hide. In other areas, a high uncontrolled rabbit population may have resulted in an outbreak of disease or a high infestation of parasites which often results in a die-off.

Pine timber stands can be managed for small game. When food and cover are added to pine tree farms, the result is more rabbits.

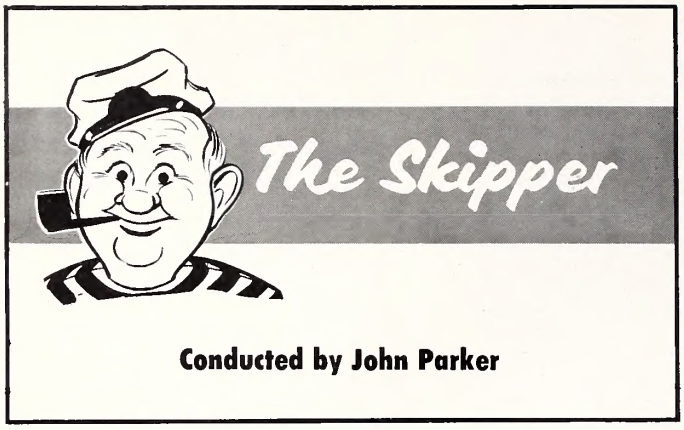
What About Hunting?

Successful rabbit hunting in pine plantations calls for a combination of short-barreled guns and good beagles. The dense cover that produces the rabbits prevents the hunter from getting a good open shot at his quarry. A pack of 10 to 15 beagles will keep the rabbits moving and it is not long until one will pass an opening where a shot can be taken. Most shots are at a close range because you can't see far in the dense cover. The ideal gun would probably be a short, open barrel, with a low power load. Due to the thick pines allowing only limited vision, *extreme care* should be taken in placing shots, especially if there is more than one person in the party.

What is the success of hunting pine tree farms? Take the record of one party of 10 to 12 hunters, using 10 to 15 dogs and hunting several adjoining pine plantations: Wednesday, 45 rabbits; Thursday, 52 rabbits; Friday, 54 rabbits; and Saturday, only 34 as it rained part of the day. On the day 45 rabbits were taken, they were jumped and bagged in about two hours. Several other hunters were hunting in near-by pine plantation areas and had similar success.

Good success? I would say yes, considering that this took place during the last week of the 1964 hunting season. In tree farms on upland areas most rabbits killed are cottontails; however, on lower areas some marsh rabbits will be included in the day's bag.

In hunting on tree farms, or anywhere else, in fact, permission should be obtained from the landowner. Hunting is permitted on most pulpwood company land provided precautions are taken against forest fire. If you like rabbit hunting supreme why not try hunting an eastern Carolina pine tree farm yet this winter?



Conducted by John Parker

HAVE you ever asked yourself the question, "Just what is a propeller?" or "How does a propeller work?" One popular boating encyclopedia defines a propeller as "a device comprising a central hub and from two to five radiating blades, used to convert the torque developed by a boat's engine into thrust to drive the boat." This sounds like a perfectly good definition and now that we agree that the propeller makes a boat go either forward or backward (headway or sternway, that is) depending on gearing, we can delve just a little deeper. That is to say a propeller drives the boat forward when it sucks water from ahead, accelerates that water and discharges it astern creating an opposite reaction. As I recall, that fellow Newton had something to say about this type of thing also.

The standard equipment propeller for most outboards or inboard-outboards is usually made of aluminum or bronze. Many propellers come from the factory painted but it takes but a few turns on a sand bar for the coating to be removed thus exposing the nature of the material.

We are told that one John Ericsson is credited with developing the propeller into something like its present form. Incidentally, Mr. Ericsson patented his creation back in 1836 and he was the same John Ericsson who designed the Monitor of Civil War fame. It is said that Mr. Ericsson's propeller sort of "twsted" the paddle wheel right out of a job.

To be able to converse fluently about propellers, terms such as *diameter, pitch, slip* and *direction of rotation* should be a part of one's vocabulary. Of course, the propeller fits onto a propeller *shaft.*

There are many things that could be said about propeller selection. Chances are very good that the propeller that comes with your motor, be it inboard or outboard, will do a reasonably good job whether skiing or cruising. Manufacturers make it their business to please the majority of buyers with standard equipment. But it need not be considered a luxury to have a spare standard propeller (this is a definite safety measure), or a spare of a design different from the original.

You may realize greater efficiency with a different propeller but prior to making the purchase be sure you know which is best to suit your needs. Many dealers can advise you from experience or can refer to handbooks for information. Of course, if you do your own repair work and are a real motor expert, you may be capable of making the selection.

What makes them go? With most power boats—big and little—it is a propeller. Whether it's a 12-foot fishing boat . . .

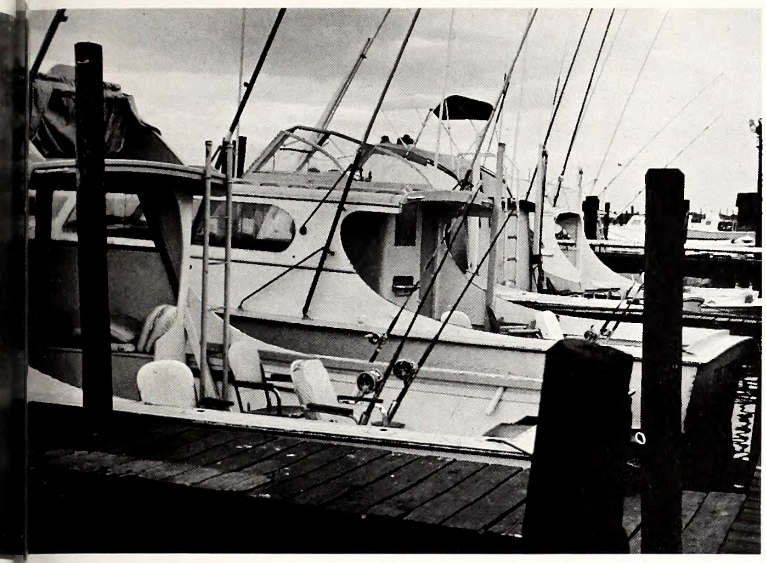
History and terminology are good to know but applied maintenance is more practical; so let's briefly discuss that.

First, let's repeat an important safety item: Carry a spare if possible and don't forget the shear pins and cotter keys if your motor requires these. Include the propeller on your trip check list. A badly twisted blade or nicks of one size or another will be fairly obvious. But look closely for hairline cracks across a blade. A three-bladed propeller runs awfully rough with one blade missing.

Minor repairs can and should be taken care of periodically by the owner. Small nicks or scraped areas can be smoothed with a file. In theory it would be well to take the same amount of filing from each blade for balance. Periodically remove the propeller and grease the shaft. If rust has formed, a very fine emory cloth can be used for rust removal. If you wish to keep the propeller (and skeg) painted, I suggest a manufacturer's fast-drying spray. (If your motor is equipped with an anti-corrosion zinc black, don't paint it). Since we are in this area of the motor (speaking still of outboards) be sure to check the lower unit oil level and add only the type prescribed in your motor manual.

We mentioned above that a badly twisted blade would be obvious. However, there may be just enough twist to cause vibration and ultimately serious damage, or wear. Attempting this repair would be risky. Here you need an experienced repairman—a craftsman.

We happened on to such a man in Wanchese this past summer. The accompanying pictures show how Mr. Edwin Wright turned a badly twisted propeller from an inboard sport fisherman into a smoothly operating "wheel" capable of delivering all that thrust we spoke of earlier.

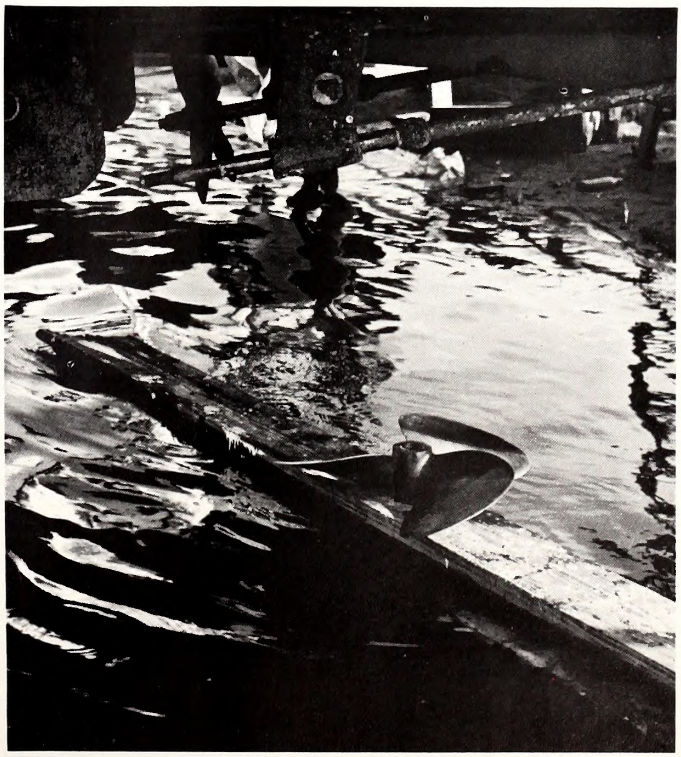


. . . or an off-shore cruiser, the power plant is only as good as the prop that does the pushing. Balance is extremely critical.

Edwin Wright checks the big prop for balance and surveys the damage. At left, the propeller is secured to a work bench and pounded skillfully. A brass mallet cushions the blows. It is exacting work.

Photos by John Parker, Jr.

At lower left, Wright puts the finishing touches on the blades with an electric grinder. The repaired and refinished propeller looks and will act like new. Below, it is ready for mounting on the shaft.



Toward Better Goose Hunting at Lake Mattamuskeet

by Otto Florschutz, Jr.
Wildlife Biologist

FOLLOWING the dismal 1964-65 goose hunting season at Lake Mattamuskeet adverse public criticism was prevalent regarding management of the flock, hunting procedures and hunting regulations in general. Much of the complaint was justifiable, because only a few weeks before federal authorities had announced an abundance of Canada geese in the Flway, an increase in the bag from two to three and once again a 70-day season. Discontent was very evident before the 1964-65 season was one week old. Both field and lake kills were low and age ratios showed a high proportion of adult and yearling geese and a subsequent reduction in young-of-the-year geese. As the season progressed, kills declined and young geese became even more a rarity. By the final week, young-of-the-year made up only 25 percent of the bag. As shown in Table I, the result was the poorest harvest and the lowest hunter success in the last six years. As a result of these developments, we were asked to make a study of factors influencing total kill and hunter success, and proposals for improving both. Our findings and suggestions follow:

Factors Affecting Kill and Hunter Success

Age Ratios:

The greatest single factor affecting both total goose kill and hunter success at Lake Mattamuskeet is annual production of young. Vulnerability of young geese to the gun is so high that this difference alone can make or break a season. Past records of good kills always are accompanied by reports of smaller geese, easier decoying birds, seemingly confused birds, heavily pin-feathered birds and other oddities such as repeated attempts of birds to land near blinds where and while shooting is occurring.

Weather:

Daily weather plays an important part in goose harvest and hunter success. Inclement weather seems to be a requisite for good waterfowl hunting. Rain and snow storms usually result in good harvest days at Mattamuskeet. Strong winds appear to move the birds more and cause them to fly lower and decoy more readily. Many waterfowl species, including geese, seek quiet water in protected coves and lee shores during hard-driving winds when the main body of the lake is choppy and rough. Cloudy weather, especially during moonlit periods, seems to reduce night feeding and to cause daylight movements. Weather changes, either from cold front to warm front or vice versa, cause uneasiness and subsequent movement and feeding. Extremely cold clear weather and icing on the lake surface and freezing of the fields influence feeding times and locations as well as movements.

Moon:

Moon phases play an important role in total kill and day-to-day hunter success. As mentioned above, weather sometimes nullifies moon brightness and night feeding, but night feeding is usually followed by reduced kill and hunter success the next day. Large movements of geese are visible and audible at the moonlit periods occurring from seven to ten days before and after full moon. Regardless of age classes or weather, peak kills occur during periods of dark nights, especially during those few days when the moon is visible only during the daylight hours. This cancels virtually all night feeding by geese and forces them to feed during hunting hours.

Population:

Total population does not seem to be a primary controlling determinant of total kill or hunter success at Mattamuskeet. The 1964-65 season might be cited as an exception since the peak population and the overwintering goose population were down 44 and 36 percent, respectively, from the previous year. With this exception however, populations at Mattamuskeet during the past 10 years have been rather constant; that is, peaking at around 100,000 geese just prior to the hunting season in early November and decreasing steadily to around 50,000 by early January. During this same period total kills and hunter success rates have varied widely.

Human Disturbance:

Human disturbance appears to influence the movement of geese. Hunting pressure, distribution of blinds, farming activities, housing, aircraft and automobiles all contribute to the goose's habits of feeding and flight patterns and schedules. During periods when other factors are not playing key roles in regulating harvest and success, increases in hunting pressure result in increases in the kill. Similarly, the use of alternate blinds or new blinds result in additional harvest on some days. Geese may be forced out of unhunted fields by adjacent farming activities or, as is sometimes the case, intentionally flushed out of fields towards nearby fields containing hunters. Late corn and bean harvests usually prevent flocks from using certain sections. The use of carbide guns and firecrackers contribute to regulated field-use, especially early in the season on picked corn fields and late in the season on young wheat.

The locations of houses, farm buildings, motels, shooting lines, etc., influence the location of flyways from the Lake to the surrounding fields. Both military and civilian aircraft traffic, over the Lake especially, disrupts goose feeding and flight patterns and occasionally causes an increase in the kill. Large rafts of

The goose season just recently closed was little if any better than that described here. Wildlife Commission Waterfowl Biologist Florschutz presents some cold facts to ponder.

geese on the Lake are flushed at times by an airplane or helicopter and the resulting movement of these birds is followed by shooting activity in nearby blinds. Sonic booms from jet aircraft sometimes cause movement in goose flocks on the Lake. Automobile traffic in parts of the refuge closed to hunting or in surrounding fields have been known to cause flock disturbance and movement and thereby influence harvest.

One classical example of how goose flight and feeding patterns are influenced by human activity involves the time of hunting at Mattamuskeet. Field hunters usually are in the blinds for a few hours after sunrise and from 3:00 P.M. to sunset in the afternoon. Later in the season, after this hunting pattern has been followed quite regularly, goose field feeding occurs from about 11:00 A.M. to 2:00 P.M. when hunters are out of the blinds, back at the restaurants eating lunch. Some hunters and guides now make it a point to hunt during the lunch hours.

Regulations:

Hunting regulations such as daily bag limits influence total kill and hunter success, but the 1964-65 season showed that bag limits are not always as important as we like to think. The goose daily bag limit was the highest in several years, yet the total kill and success rate were the lowest. Probably even a ten goose bag limit wouldn't have produced a ten percent increase in total kill or success rate this year. Season length, of course, influences harvest in that it determines the number of hunter-days and the extent to which inclement weather and other kill-producing factors can operate. At Mattamuskeet however, total field and lake hunting pressure has varied only 20 percent from the highest hunting pressure season (1963-64) to the lowest (1959-60) when 70- and 60-day seasons, respectively, were in effect. During this same period the total goose kill has varied 62 percent with both extremes occurring in 70-day seasons.

A good example of how regulations can affect kill and hunter success occurred during the 1957-58 season at Mattamuskeet. There was an unusually abundant crop of juvenile geese that year and the goose call record player was still legal. It was used by many hunters and guides and resulted in record kills for nearly all participants. What was probably the highest total kill and hunter success in the history of Lake Mattamuskeet occurred that year. Use of record players for calling geese while hunting was made illegal after that season.

Factors Affecting Hunting Pressure

Previous Year's Success:

Studies conducted during the past six seasons indicate that the previous year's success strongly influences over-all hunting pressure on Lake Mattamuskeet. Generally speaking, fewer hunter-days will occur following a poor season and an increase in hunter-days will follow a good season, regardless of the success of the current season. During the past six hunting seasons (see Table II), two exceptionally poor seasons occurred when hunters averaged less than one-half a goose per day. These were in 1961-62 and in 1964-65. One exceptionally good season occurred in 1962-63 when the hunter success reached 1.024 geese per day. Since one-third of the Mattamuskeet hunters come from outside North Carolina and a large proportion of the resident hunters come farther than 100 miles, hunting and overnight accommodations are made by most of the hunters prior to the start of the season or shortly thereafter. For this reason many parties that had poor success the previous year will decline invitations or reduce the number of trips the following year.

Can we have better goose hunting? A complete analysis of what has happened is the first step toward improvement.

Production:

Undoubtedly, reports of good production on the breeding grounds result in some additional reservations for blinds and other accommodations being made. But goose production reports have been taken lightly in the past and rightfully so because the major production areas are in such remote portions of northeastern Canada that surveys have been unreliable. Indirectly however, goose production plays an important role in determining hunting pressure, since some additional hunters will come to Mattamuskeet if the kill is good. Therefore, if the annual production is good, the kill will be good and an increase in hunter-days will probably result.

Weather:

It is estimated that about one-third of the Mattamuskeet goose hunters live within 100 miles of the Lake. Many of these make no shooting blind reservations but when the Weather Bureau reports a front moving into eastern North Carolina, they will drive to the Lake for a day or weekend hunt. Weather reports are followed closely by both this type of hunter and local guides. Therefore, weather plays an important role in regulating seasonal hunting pressure.

TABLE I
ANNUAL HISTORY OF MATTAMUSKEET FIELD AND LAKE GOOSE HARVESTS, CRIPPLING LOSSES, POPULATIONS LOSSES AND AGE RATIOS, 1959-65

Season	Kill	Field Hunters	Success	Kill	Lake Hunters	Success	Kill	Combined Hunters	Success	Comb. Crip. Loss	% of Population Lost*	Adult-Juv. Ratio
1959-60	4,973	6,623	0.751	2,014	3,844	0.516	6,987	10,467	0.668	15.4	8.8	39:60
1960-61	5,397	7,819	0.690	3,020	4,389	0.688	8,417	12,208	0.689	27.2	12.2	39:60
1961-62	3,568	7,386	0.483	2,045	3,867	0.529	5,613	11,253	0.499	31.2	10.0	80:18
1962-63	7,820	7,729	1.012	3,933	3,753	1.048	11,753	11,482	1.024	20.9	23.7	43:56
1963-64	7,762	8,868	0.875	2,614	4,216	0.620	10,376	13,084	0.789	16.2	20.6	43:56
1964-65	3,133	7,277	0.431	1,345	3,745	0.359	4,478	11,021	0.406	20.1	12.3	60:40
Averages	5,442	7,617	0.714	2,495	3,969	0.629	7,937	11,586	0.685	21.8	14.6	51:48

*Population loss calculated from in-season average rather than overwintering peak

Moon:

The moon plays an important part in determining what portions of a hunting season will be utilized by hunters. Pre-season hunt reservations are almost always made for the first few days of a hunting season and for the dark-night periods, while the direct opposite effect is evident on light-night periods. Over the years, the hunters and guides have become acquainted with the goose's night feeding habits during light nights and thus dark nights are considered more desirable for reservation choices than any other days, weekends or holidays, with the exceptions of opening week and the opening of the duck season.

Populations:

To most hunters, the number of geese present at Mattamuskeet makes no difference since they are unable to detect slight fluctuations in population size. What makes a difference to the hunter is whether the geese are moving or not moving. However, even if the geese are not moving, if geese can be observed in the fields or on the Lake, hunters will continue to hunt for them hoping that they will move. When, as in 1964-65, very few geese are seen, great concern is voiced regarding the poor hunting. When none or only a few geese are observed, hunting pressure declines and interest is lost.

Time of Season and Time of Week:

Usually, hunting pressure is heaviest during the first four days of the season regardless of whether the season opens during light or dark nights and regardless of weather, population and production reports. After the first few days, heavy hunting is pretty well confined to inclement weather periods, Saturdays and the holidays of Thanksgiving and New Year's Day. Christmas Eve and Christmas Day are poor hunter-utilization days regardless of success. Goose hunter utilization is usually much lower in the last days of the season, particularly if the duck season has already closed. Usually a small increase in hunting pressure is evident the last day or two.

Saturday is the most popular day for waterfowl hunting at Mattamuskeet. In a special study conducted last season, hunting pressure on all Saturdays was 17 to 23 percent higher than the next most important day, which was Monday. Wednesdays and Thursdays usually are the days when hunting pressure is the lowest. Hunting pressure on these days ranged from 41 to 45 percent lower than Saturdays.

Regulations:

No attempt has been made to measure the difference in hunting pressure between years of stricter regulations and more lenient regulations. Each year there are a few highly dissatisfied hunters who claim it is their last trip to Mattamuskeet. In the case of the goose bag increase in 1964-65, hunters who were satisfied with two geese the previous year were unhappy with bagging two geese when the limit was three. A few years ago when the Hyde County law prohibited shooting after 4:00 P.M. many of the hunters and guides were dissatisfied since the geese waited until after 4:00 P.M. to feed in the fields. During recent years when the sunset closing time has been in effect, there has been sentiment to revert to the four o'clock closing.

Methods to Increase Kill and Hunter Success

Since it is possible to increase total kill without increasing hunter success rate, and it is possible to increase hunter success rate without increasing total kill, these two goals should be considered separately. Also, we should consider whether we can substantially increase kill and still retain quality hunting. The proposals discussed below are by no means foolproof. Some have been successfully used on other goose harvest areas, some can be applied to Lake Mattamuskeet only, and some are only inferential ideas.

The ratio of immature geese, the weather, moon phase and population level are all natural factors which influence the total kill of Mattamuskeet geese. Little can be done to change these, but there are several factors which can be modified. Gunning laws, human disturbance and hunting pressure can be altered to increase total kill. Season length, distribution of hunting pressure, the outlawing of certain hunting methods, establishment of rest areas and enforcement can all contribute and should be considered when one wishes to change the level of harvest and success on a given area.

Season Length:

The season framework is set annually by the U. S. Fish and Wildlife Service and in the past we have always taken the longest allowable time by counting back

TABLE II
ANNUAL NUMBERS OF HUNTERS AND GOOSE HUNTER SUCCESS AT LAKE MATTAMUSKEET, 1959-65

SEASON	HUNTERS	SUCCESS	PERCENT CHANGE IN HUNTERS
1959-60	10,467	0.668	—
1960-61	12,208	0.689	+ 14.3
1961-62	11,253	0.499	— 7.8
1962-63	11,482	1.024	+ 2.0
1963-64	13,084	0.789	+ 12.2
1964-65	11,021	0.406	— 15.8

from the latest allowable date. The past few years this date has been January 15 and the season length has been 70 calendar days. To increase kill however, we might consider a split season, taking the required ten percent, or seven-day cut. If the first part of a split season were scheduled to start in mid-October, it would coincide with the arrival date of a large portion of the Mattamuskeet goose flock. If the season ran from mid-October to mid-November and from December to early January (concurrent with the duck season closing), we would have the season during the peak migration period and not after, as at present. Under such a schedule, we would have the continuous arrival of new and less wary geese. A two-week closed period would allow the geese to resume a field feeding pattern which would probably increase lake and field goose kill during the second half of the season. This would eliminate the early to mid-January goose hunting period we have now, during which very few geese are killed. Duck hunting seasons would continue as at present so that part of the duck hunting on the Lake would occur during the closed goose hunting period.

Dispersal of Hunting Pressure:

After 15 years of shooting the same parts of the Lake, the geese have probably become pretty well aware of the danger zones. If the 36 blinds could be distributed into four separate and equal areas around the Lake, each containing nine blinds and nine alternates, and if the use of these were regulated by weeks or periods within each season, the kill could probably be increased. For example, during light-night periods, when pressure is low, only 18 blinds would be used in areas A and C. If hunting pressure increased the following week, area B could be opened or if necessary areas B and D. On Saturdays, during storms, or in periods of dark nights when pressure warranted, all areas could be opened. This would at least prevent the geese from identifying danger zones and establishing flight patterns detouring around them. It might also be advisable to change two of the hunting areas each year to allow goose usage on virtually every part of Lake Mattamuskeet during the year. This would probably improve usage of some fields, or perhaps distribute it more equitably around the Lake.

Regulations:

Shot larger than Number 2 should be more widely prohibited, to prevent long distance shooting by field hunters, thereby reducing goose crippling losses. It has been reported that fields consistently being shot with BB's and buckshot are soon completely by-passed by geese and that the effects are even felt in adjacent fields where large shot are not being used.

Some consideration might be given to again establishing a shortened afternoon shooting time, so that geese can become used to daylight feeding and be less dependent on night feeding which is now forced upon them by shooting until sunset.

Consideration might also be given to a mid-week closure to hunting. Data collected in 1964-65 indicated that Wednesday and Thursday are the two least hunted days; while Monday, following the closed Sunday, is the day when highest hunter success occurs. Saturdays, consistently are the days hunter success is the lowest. The extra day of rest may well be beneficial to hunters and geese alike, by compacting hunting pressure and taking some of the wariness out of the birds.

To maintain the sporting qualities of goose hunting, we might consider limiting lake blind hunters (during the goose season only) to six or eight shells. Too many times one hears from a guide that a hunter shot more than a box of shells to get two geese. The practice of limiting shells would contribute also to a reduction of crippling loss and would increase pride of accomplishment on the part of the hunter.

Habitat Improvement:

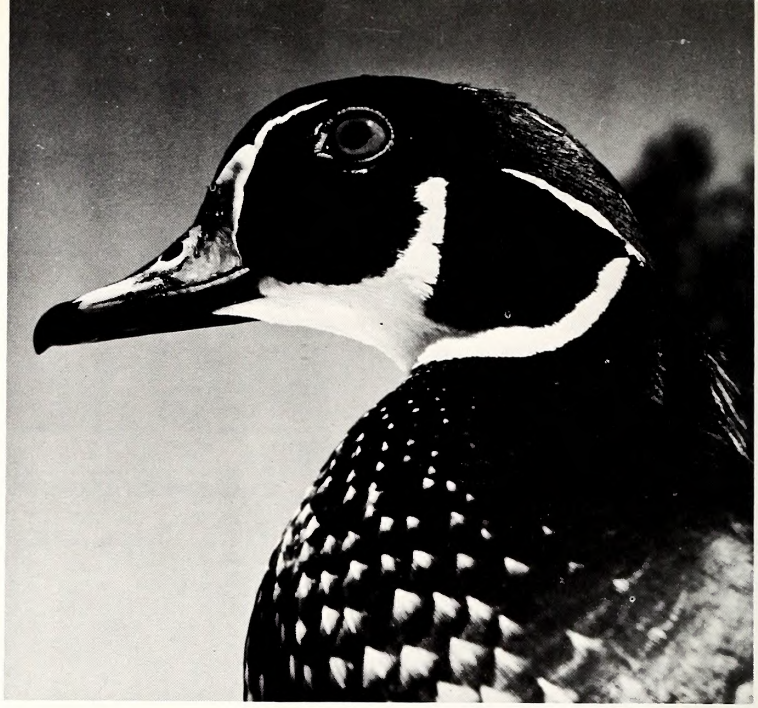
Consistently, the better goose hunting blinds on the Lake have been those located on the east end. These are close to the refuge's farming operation where corn and soybeans are grown and harvested annually. As a result, an overwintering nucleus of geese stays in that portion of the refuge, feeds in those fields and supplies fairly consistent shooting for east-end blinds and private fields in the vicinity. In order to provide a similar advantage to blinds and fields on the west end of the Lake, it would be desirable to consider the establishment of a similar acreage of fields on that part of the refuge. The refuge boundary line excludes most highland on that end, so it might be necessary to clear, dike, and farm Head of Lake Island, Big Island and Heron Bay Island. To prevent rainfall from flooding the crops during the growing season, might require installation of pumps as at the east end.

The extent to which these management measures can be expected to sustain or improve hunting is at best conjectural. However, we are now taking only about ten percent of the flock by hunting and the reproductive capacity of the species indicates that a 20 percent harvest can be supported. Hence an effort to increase total harvest to this degree or to improve hunter success ought not jeopardize the flock.

Part 2

Life History and Management of the Wood Duck

by John P. Hardister
Wildlife Biologist



F. EUGENE HESTER

IN the faint predawn light a fine-veiled mist rose in wisps from the still surface of the woodland pond. The air was chilly this April morning and I shivered slightly as I sat huddled in a thicket by the pond's edge. The eerie call of a barred owl drifted from the direction of a distant river swamp. The towering forms of pine, oak, and hickory on the opposite shore stood silhouetted against the sky, their trunks disappearing into the mist. My attention was focused on the dark outline of a wooden box attached to a stake that descended into the murky water about 10 feet from shore and immediately in front of my position.

Suddenly from somewhere over the mist-shrouded pond came a shrill, plaintive cry—"whoo-eek, whoo-eek, whoo-eek." The unmistakable call of a startled female wood duck reverberated through this otherwise silent world. My pulse quickened with the sound. Wood duck activity had begun for the day. It shouldn't be long now!

As the sun climbed higher in the heavens, the mist that enveloped the pond began to disappear. Additional boxes were now visible at various locations around the pond. Some were attached to stakes or dead snags over the water, while others were fastened to tree trunks along the shore. As the last vestiges of fog disappeared, pairs of wood ducks could be seen swimming on the calm surface of this, their breeding pond.

Suddenly my attention was attracted by a female wook duck winging her way across the pond in my direction. Without hesitating, she flew directly to the box in front of my position. Checking her speed at the last possible instant, she perched momentarily at the entrance before disappearing inside. This particular hen had returned to the nest from her customary morning feeding flight to brood her day-old ducklings. This morning the ducklings would be leaving the nest.

Down They Go

Many tales have been told about how the little ducklings make the trip from the nest to the water. Some writers have said that the mother carries each duckling in her bill, on her back, or between her legs. Recent observers proclaim that the ducklings tumble out of the nest without physical contact with their mother. I had to see what would happen for myself and the brood in the nest box before me offered the necessary opportunity.

As I patiently waited in my hiding place, each wood duck hen entered her respective nest box. Those females still laying eggs remained in the nest only a few minutes before departing with their mates. The drakes of incubating hens departed after waiting short periods of time for their nesting mates. Soon all was quiet on the pond.

I continued to watch the nest box before me. From a nearby dogwood tree a male cardinal began his song of "what cheer, what cheer, purty, purty, purty." Another cardinal answered from across the pond. As I was changing to a more comfortable position, the hen reappeared at the nest entrance. I froze and hoped that she had not seen my movements. For what seemed an eternity, the hen intently scanned the area for possible danger. Apparently satisfied that all was safe, she dropped to the water beneath the nest and swam back and forth while watching the entrance. She had not discovered my presence after all.

The hen began uttering a series of subdued calls. Immediately the ducklings began peeping loudly from within the box and in a few minutes one youngster appeared at the entrance. For several moments it perched there, then sprang into the air with webbed feet outstretched and wings rapidly beating, but to no avail. With a gentle splash the duckling landed on the water and swam to its mother's side. In rapid succession ducklings swarmed from the nest box. They jumped into space and tumbled

head over heels into the water, sometimes two at a time. Every duckling could swim upon contact with the water.

Although the exodus of ducklings from the nest box took less than five minutes, I sat entranced as the sequence of events unfolded before me. After the hen and her brood of 12 ducklings had crossed the pond and disappeared among the vegetation along the far shore, I relaxed and smiled to myself. This had been an outdoor drama that I would never forget.

Since that early morning in April, I have watched several dozen wood duck broods leave the nest. In each case ducklings responded to the call of their mother by jumping unassisted from the nest to the ground or water below. But watching young wood ducks leave the nest has only been part of the pleasure I have derived from wood duck management. Being able to observe the nesting pairs as they arrive on the pond and to follow each of the events in the wood duck's fascinating life cycle, have all been exciting experiences aside from realizing worthwhile contributions to wood duck populations.

Out they come! Part of the family waits patiently for the rest of the brood.

You, too, can follow the entire nesting cycle of the wood duck from the arrival of the first pair to watching tiny ducklings tumble from the nest. Let us see how you can participate in these fascinating adventures and how important your contribution can be to wood duck populations in North Carolina.

Habitat Is the Key

Wood ducks are dependent upon the availability of suitable habitat within the deciduous forest region of eastern North America. These habitat requirements include: tree cavities for nesting, and water areas with brushy borders and emergent aquatic vegetation for feeding and the rearing of young. Wood duck numbers are determined largely by the quality and quantity of these and other necessities. Human beings and wood ducks reach their greatest population densities in the same geographical region. As a result, wood duck habitat, and consequently the ducks themselves, suffer from the ever expanding encroachments of civilization.

Logging operations continually remove much of the mature timber that provides natural cavities for nesting woodies. An acute wood duck housing shortage has resulted in many areas from these operations and from such forestry practices as the removal of unsound and deformed trees, and girdling or poisoning of those species which have low economic value to man.

This destruction of natural nesting sites helps to explain why wood duck numbers have dropped so severely during the past century and the present scarcity or absence of wood ducks in areas where they were once abundant. Cut-over timber stands are replaced by second growth vegetation that is not suitable for nesting wood ducks. It takes nature a long time to create cavities in trees large enough to accommodate nesting woodies and the high demand for wood often means that much of the second growth timber will be cut before it reaches the cavity-forming stage.

Drainage of river bottomlands and other swamps has eliminated much wood duck habitat and has greatly reduced the number of nesting sites. Land cleared for farming and for urbanization, which normally follow drainage, has resulted in further habitat reduction. Even when wood duck nesting trees remain in such areas, suitable water for the welfare of both adults and young has been eliminated or reduced and the value of such areas for wood ducks has been seriously impaired.

Fortunately wood ducks respond favorably to certain management practices which help alleviate some habitat losses. Among these are the acceptance of artificial nesting structures of suitable design when they are placed in favorable locations. However, very few artificial nesting structures are currently available for use by nesting wood ducks in North Carolina. This is a most unfortunate situation as many of the thousands of privately-owned farm ponds and other bodies of water throughout the State could be individually managed to produce wood ducks, especially in localities where nearby water areas are suitable for the rearing of young but the scarcity of natural cavities is the main factor limiting wood duck production.

The entire task of wood duck management should not be left to governmental agencies as they cannot do all of the work that is needed to maintain adequate waterfowl populations everywhere. With over two-thirds of the State under private ownership, much can be done at the individual level to insure the welfare of the wood duck. Since current land-use patterns make the outlook uncertain for the species,

individual initiative on private land is essential if we are to maintain wood duck populations for future generations to enjoy. At the present time, important guidelines for wood duck management include: (1) abundant natural and predator-proof artificial nesting facilities; (2) maintaining and developing as much high quality feeding, rearing, and wintering habitat as possible; and (3) maintaining a safe balance between production and harvest.

You Can Help

If you possess a genuine esthetic or sporting interest in the welfare of the wood duck you can help maintain the species by providing predator-proof artificial nesting structures at appropriate locations, voicing opposition to unnecessary wetland drainage and insisting that wood duck and other waterfowl values be incorporated in forestry and watershed management programs, and observing waterfowl hunting regulations. All of these are important aspects of wood duck management and offer an opportunity for you to make an important and worthwhile contribution. Assuming that the last two procedures mentioned are self-explanatory, let us proceed with information necessary for initiating a successful wood duck nest box program.

Many different types of both wooden and metal structures have been devised for nesting wood ducks. Even used ammunition boxes, old nail kegs, and 100-pound grease drums have been employed with varying degrees of success. However, most make-shift structures do not justify the time required to adapt and erect them as they have such a short useful life. Consideration should be given to a structure that can be economically constructed yet will provide years of service with little maintenance. A nest box that will last for many years will cost little more to build than a structure that will last only a few years.

Complete details for building a wood duck nest box appear on page 23. If constructed of cypress lumber and galvanized nails, this box will provide many years of service and require little maintenance. The following suggestions will help in its construction.

- Use inch-thick, rough-sawed cypress lumber. Cypress is noted for its durability and resistance to rot. The rough surface will permit the ducklings to escape from the nest. If dressed lumber must be used, tack a 3-inch wide strip of fine hardware cloth on the inside of the box from the bottom to the entrance hole. This will enable the ducklings to escape what would otherwise be a death-trap.
- Use 8-penny or 10-penny galvanized nails for maximum rigidity under all kinds of weather conditions.
- If pine or other less durable lumber is used, treat it with a clear preservative containing pentachlorophenol. Do not use cresote. Dark preservatives on the outside of the box may lower its acceptance by wood ducks as bright new boxes are more readily accepted, probably because they are more easily seen by the ducks. Allow ample time for boxes to dry before their erection.
- Any cracks, knotholes, or other defects should be covered with galvanized metal in order to exclude light from the interior. Wood ducks will not use boxes with holes or cracks that admit light unless they are forced to do so because of a lack of more suitable sites.
- Complete the box by adding three inches of sawdust and wood shavings for nesting material. Both should be used as sawdust alone tends to pack. Wood ducks will not ordinarily use nest boxes that do not contain some sort of nesting material.

Wood duck nest boxes are worthless unless they are properly placed in areas where they will likely be used. Nest boxes should be erected in habitat areas where wood ducks are known to occur. If at all possible, attach boxes to trees, stout snags, or cedar posts which are surrounded by water and face the entrance hole toward open water. Such structures will be conspicuous to nest-seeking females using the water area.

Boxes placed as low as five feet above the surface of the water will facilitate inspection and maintenance with the use of a boat. However, if water levels fluctuate, make sure the boxes are placed well above the high water mark. Placement of nest boxes over water will also make them less available to predators but only to the same extent as natural cavities surrounded by water. In order to insure the safety of the eggs and incubating female, always attach a predator guard (such as the cone-shaped metal guard illustrated on page 23) to each and every support. Nest boxes that are not protected from predators do more harm than good to nesting woodies.

Look to Farm Ponds

Wood ducks often frequent farm ponds, especially those which possess good shoreline cover and are located near rivers, lakes, or other natural water areas. Such ponds often make ideal wood duck nesting areas but may lack suitable nest supports surrounded by water. In such cases cedar posts may be used to great advantage. Use a boat and have a friend hold the post in position while you drive the post firmly in place with a maul.

Isolated trees of six-inch trunk diameter or less, along the shore of water areas frequented by wood ducks, make suitable nest supports only as long as they are equipped with effective predator guards; free from any overhanging limbs that might allow predators to gain access; and erected at least 10 feet above the ground. Face the entrance hole toward the water and remove any vegetation that might obstruct the entrance from the visibility of ducks using the water area.

Make certain that all nest boxes are mounted in a vertical position or tilted forward at a slight angle. This will provide a ready means of escape for the young ducklings. Boxes tilted backward could prevent the exodus of ducklings.

No attempt should be made to conceal nest boxes. In fact, those boxes that are most conspicuous

will likely receive more frequent use by nesting woodies.

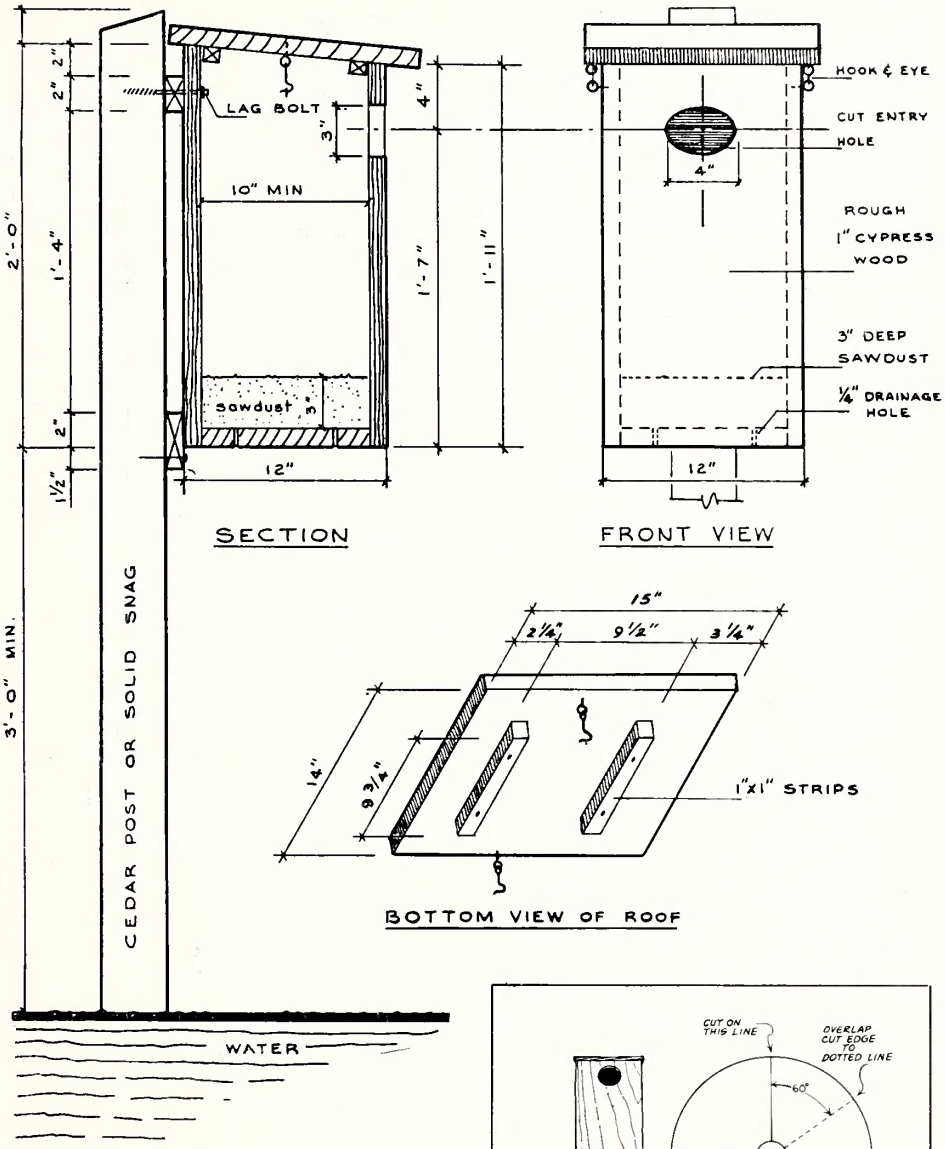
All nest boxes should be checked prior to each nesting season. Make repairs and replenish nesting material as needed.

Predators upon wood duck nests in North Carolina include the raccoon, opossum, and black rat snake. Raccoons are the most destructive and cause far more damage than all the other predators combined. They consume many wood duck eggs and kill incubating females at every opportunity. The intensity of predation by raccoons upon wood duck nests varies from year to year as populations of these predators, wood ducks, and other prey species change, even though the nesting habitat is essentially unchanged. This means that at times excessively high local raccoon populations may be a serious factor limiting wood duck production.

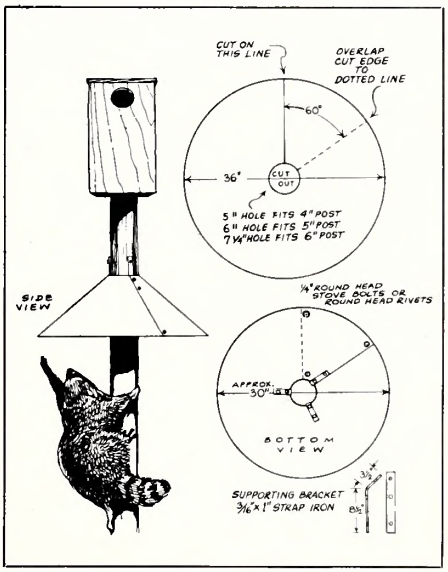
Raccoons may not bother unguarded nest boxes for the first year or two, but sooner or later a few learn, perhaps by accident, that wood duck nest boxes may contain a meal. When this happens, some raccoons develop a predilection for raiding nest boxes — seeking out and entering every unguarded box they can find. Oval-shaped entrances (as depicted on the nest box diagram) will discourage the raids of large coons only. Some raccoons will enlarge the opening with their teeth until they can enter without difficulty. The best safeguard against raccoon depredation is to install an effective predator guard for each nest box.

The black rat snake is adept at climbing trees and entering cavities in search of birds' nests. This species will enter wood duck nest boxes and eat eggs whenever it happens to find them. For this reason, make certain that predator guards are tightly mounted against the nest support to keep the snake from squeezing through.

Various wildlife species compete with wood ducks for occupancy of nest boxes. Among these are squirrels, raccoons, opossums, and several species of birds. In some areas starlings are serious competitors, often building a nest over a clutch of wood duck eggs. When starlings begin to use wood duck nest boxes, discourage them by constantly removing their nests. Cone-shaped predator guards will eliminate most of the other undesirable competitors.



By following these plans, you can create homes for woods ducks. Be sure to use some sort of predator shield similar to that shown at right.



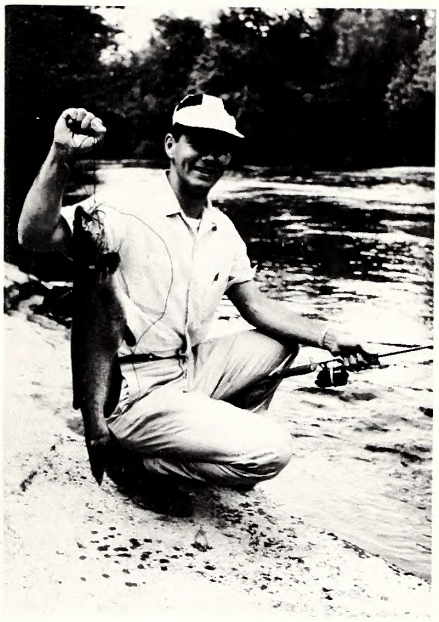
Start Slowly—But Start

When initiating a wood duck nest box program, erect only a few nesting structures in any single area during the first year. If they are not used by wood ducks, then little time or money will have been spent needlessly. In such cases, boxes can be relocated. When the structures are used, increase the number of boxes each year as the breeding population increases. Wood ducks are gregarious to the extent that they will tolerate others of their kind nesting nearby. There are, therefore, no established rules for spacing of nest boxes. They may be erected in pairs or small groups if desired, although single boxes tend to receive more frequent use by wood ducks. • **continued on page 30**

Creel Census-3

The Catfishes

by Frederic Fish
Ass't. Chief, Division of Inland Fisheries



Prompted by growing evidence that the catfishes constitute an important segment of the rod-and-reel catch from the inland waters of North Carolina, the Wildlife Resources Commission proposed that the fork-tailed catfishes be included among the game fishes in 1966.

The proposal expectedly evoked a loud protest from commercial fishermen taking catfish by traps from the inland waters under authorization of a special device license. A total of 16 commercial fishermen testified against granting game-fish status to the fork-tailed catfish at the three public heairngs conducted on the proposed 1966 Fishing Regulations. These gentlemen deserve serious consideration for over the years they have developed a geographically widespread and, in some instances, a highly lucrative inland-water fishery without benefit of governmental encouragement or subsidy.

The opposite side of the issue, however, requires that the Wildlife Commission also consider the interests of approximately 200,000 anglers who seek pleasure and recreation catching catfishes by rod and reel. Wildlife in North Carolina *herein presents the sportsmen's side of the issue in a summary of catfish catch data derived from the Statewide Creel Census of 1964-65.*

The catfish issue is not entirely a simple conflict of interests between the commercial and the sports fishermen. Underlying it is the impersonal fact that commercial catfish culture, which has proved a remunerative industry in many southern states, will not develop in North Carolina simply because it could not compete against a small price differential that the commercial catfishermen exploiting the natural waters could well afford to grant to assure them control of the wholesale market. Underlying it also is the impersonal fact that certain species of catfish currently face decimation, if not extermination, in the completely unregulated commercial harvest from North Carolina's inland waters.

The catfish issue in North Carolina is strangely reminiscent of the late 1920's when the largemouth bass commanded premium prices on the New York and Baltimore fish markets and the bulk of the supply came from Currituck Sound.

THE term "catfish" technically includes all of the many members of the taxonomic family Ictaluridae. To the practical fisherman, however, "catfish" represents any of about a dozen assorted species found in North Carolina waters that range from the tiny madtom—of about the same weight and "voltage" as a full-grown bumblebee—to the 40- and 50-pound flathead catfish of the New and the lower French Broad Rivers. In between, are four species of bullheads as well as the abundant white and channel catfishes.

The catfishes as a group have been held somewhat in disrepute as the arch enemies of the game fishes and, at very best, perhaps worthy of "commercial fish" status. "Lowlycatfish" is as much a one-word term among most sportswriters as is "damyankee" with the "possum and tater" set. Recently, however, the catfish has been winning his fight for social recognition. While the catfish might be considered an enemy of the black bass in the artificial environment of a food-short farm pond, he seldom seems to be so in Nature, for generally these two fishes do not frequent the same type of waters. Even where they do, no consequential conflict of interests seems apparent. Certainly, as a fighting fish the catfish yields to nothing of comparable size found in fresh water and more and more sports fishermen seem to be discovering this fact. A fly-rod addict who just happened to communicate with a channel catfish via a wet fly will recount every trivial detail of that exploit on the least provocation and will do so long after the biggest bass has been forgotten.

The Statewide Creel Census uncovered some very interesting data upon the popularity of the catfish among the rod-and-reel fishermen. The catfish does support a very substantial sports fishery as evidenced by the fact that 10 percent of all fish taken by rod and reel from the public inland waters of North Carolina are catfish. As a standard for comparison, the largemouth bass contributes but 3.6 to the total harvest and the mountain trout 3.5 percent. This statement not only is true statewide, but it is applicable to most of the Commission's nine Districts as shown by the data summarized in Table 9-A showing comparative catches on a District basis.

The apparent popularity of the catfish indicated by the magnitude of the catches does not stem from a large number of catfish being caught by a relatively few anglers. Actually, the

Table 9-A

District	Percentage of Total District Rod-and-Reel Catch Represented by Catfish, Largemouth Bass, and Trout		
	Catfish	Largemouth Bass	Trout
1	7.2	4.4	—
2	10.0	3.6	—
3	12.8	3.5	—
4	14.8	3.0	—
5	14.7	2.3	—
6	12.0	1.8	—
7	10.3	2.7	12.8
8	6.6	7.0	8.5
9	11.9	2.0	26.4

Table 9-B

District	Percentage of Successful Fishermen with Catfish in Creel at Time of Contact
1	28
2	23
3	24
4	26
5	36
6	32
7*	28
8*	12
9*	26

*Excluding fishermen contacted in designated mountain trout water

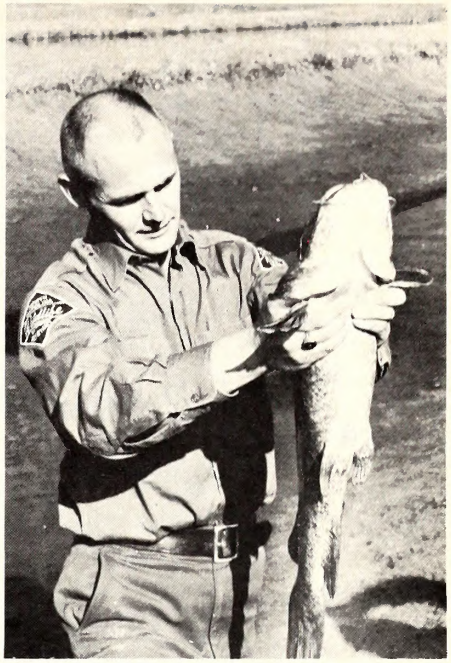
Table 9-C

District	Cane Pole	Fly Rod	Casting Rod	2 lines	>3 lines
1	81.0	0.8	14.8	3.3	0.1
2	65.5	1.9	15.1	16.8	0.6
3	69.0	0.8	16.5	13.7	< 0.1
4	61.0	2.8	22.7	13.5	< 0.1
5	44.5	0.2	21.7	33.6	< 0.1
6	53.2	0.3	23.1	23.3	< 0.1
7	10.9	1.3	74.6	13.2	< 0.1
8	15.7	0.4	77.5	6.4	< 0.1
9	19.3	4.2	73.9	2.6	< 0.1
Statewide	52.2	1.9	31.5	14.3	0.2

Table 9-D

District	Percentage of the Total District Rod-and-Reel Catfish Catch Taken While Fishing With:		
	Natural Baits	Artificial Lures	Both
1	92.2	1.0	6.7
2	88.5	0.9	10.5
3	98.7	0.3	1.0
4	93.9	0.7	5.4
5	92.9	0.8	6.4
6	91.2	0.5	8.3
7	83.5	1.0	15.5
8	86.4	0.5	13.1
9	96.4	< 0.1	3.5
Statewide	90.5	0.7	7.9

catfish rates very high in popularity among the rank-and-file fisherman as is well demonstrated by the frequency with which a catfish was found in the creel. Statewide, one out of every four (26 percent to be exact) rod-and-reel anglers of other than mountain trout waters who had *anything* in their creel at the time of Census contact was taking at least one catfish home. Again, the popularity of the catfish was not sectional for the data summarized in Table 9-B show that invariably (except for District 8) between one-fourth and one-third of all successful anglers contacted had a catfish in their creel.

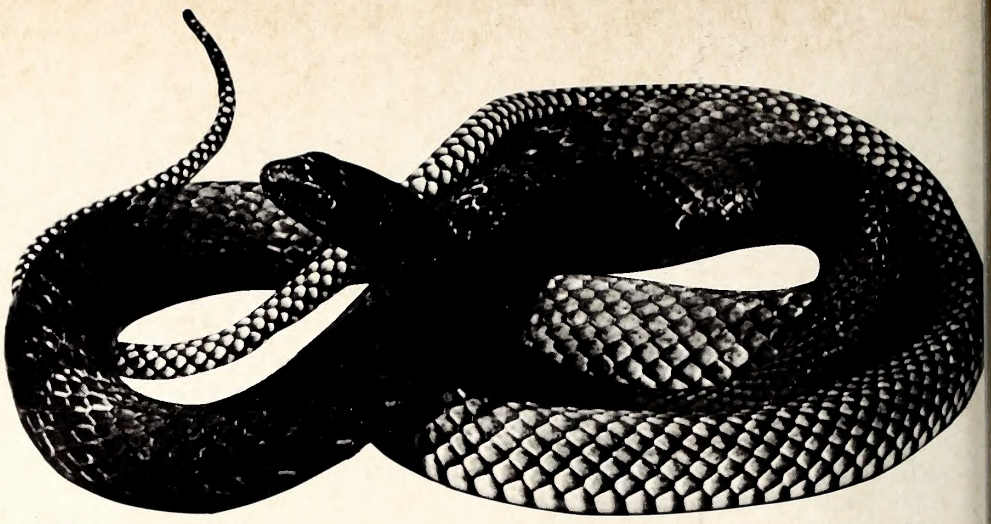


This is the heavyweight of the catfish clan, the flathead. They reach 75 pounds.

Having established the general popularity of the catfish, the question arises as to what sort of rod-and-reel fishery does it support. The Census data summarized in Table 9-C indicate that rod-and-reel catfishing is principally a cane-pole operation in the Coastal and Piedmont Districts at least. Irrespective of the fishing gear employed, there is little doubt that statewide, most catfishing is effected with natural baits. The data summarized in Table 9-D are very convincing in this respect.

The fact that catfishing is basically a cane-pole-natural-bait proposition reasonably leads to a conclusion that it is done primarily by unlicensed anglers fishing under the county-resident-natural-bait license exemption. Summarizing the catfish catch data in relation to the license category of the fisherman, as presented in Table 9E, confirms the opinion that the license-exempt county resident fishermen do account

• **continued on page 31**



The Eastern Coachwhip

by Franklin F. Snelson, Jr., and William M. Palmer

Cornell University and State Museum of Natural History

PROBABLY attaining the greatest maximum length of any North Carolina serpent, and certainly among the longest of all snakes inhabiting the United States, the eastern coachwhip, *Masticophis flagellum flagellum,* may grow longer than 8 feet. The average length of an adult specimen is about 5 feet, and the largest example recorded from North Carolina measured 7 feet, 9 inches.

Adult coachwhips are easily identified by the usual "two-toned" color, a distinguishing characteristic found in no other local species. The head and about 1/3 of the forward portion of the body are shiny black; the remainder of the body is light brown. The large scales, unusual color distribution, and very slender body probably resulted in the appropriate common name of "coachwhip," for there is at least a superficial resemblance to the "two-toned" coachman's whip of the horse and buggy days.

Juvenile specimens often are difficult for the average person to identify, as they slightly resemble the young of the black racer. Besides a difference in the number of posterior scales, the pattern in baby coachwhips is typically dark, wary crosslines; in small black racers the pattern is composed of grayish blotches down the middle of the back. Both species lose the juvenile pattern upon approaching maturity.

The distribution of the eastern subspecies extends from North Carolina south throughout most of Florida and west into the eastern portions of Texas and Oklahoma and extreme southeastern Kansas. Other races occur farther westward and to the south into Mexico.

In North Carolina the coachwhip shows a decided preference for dry areas of sand, pine, and scrub oak interspersed with thick bays. It is a fairly common species in the Sandhills, and occurs in the coastal plain at least as far north as Craven and Carteret counties. Specimens are not infrequently discovered in flatwoods of longleaf pine and wiregrass, but seem to avoid wet bottomlands and extensive pocosins.

Agile indeed is the "snake hunter" who adds this elusive serpent to his bag of live specimens, for the coachwhip probably is the fastest of all native snakes. When first disturbed in the open a specimen will make a rapid dash for cover, usually quickly disappearing from view into a thick bay or down a convenient stump hole before the startled would-be collector can gather his wits. If caught or cornered the coachwhip is quick to defend itself and large ones are capable of inflicting rather deep although superficial scratches. Unlike many species the coachwhip apparently forages about only during the daylight hours. We have seen specimens abroad in the Sandhills Wildlife Management Area when the temperature was so high that other snakes had apparently been forced to seek shelter from the heat.

It has been stated that the superstition that "whip-snakes" will chase, catch, and beat a person perhaps came into being during slave times. Supposedly in an effort to stop desertion, an overseer or plantation owner would tell his charges of a formidable serpent inhabiting the surrounding area that would most assuredly beat to death with its long tail anyone who tried to escape from the plantation grounds. Even today there are those who hold fast to their belief in this absurd myth. It would certainly make it most convenient for the snake collector if the coachwhip did make some attempt to attack him!

The food of this species consists of small mammals, birds and their eggs, smaller snakes, and lizards. Active prey is overcome by pressing it to the ground with a fold of the snake's body. It is unfortunate that this attractive and generally beneficial serpent does become a major predator on quail preserves where much of the diet is composed of eggs and young birds. Some such refuges in South Carolina and Georgia have offered bounties for dead coachwhips. The coachwhip should, however, be left unmolested in the more remote portions of its preferred habitat.

There is very little information available concerning the breeding and young of this snake in North Carolina. Mating presumably occurs in the spring and about a dozen elongated eggs are laid during the early summer; hatching probably takes place in the late summer or early fall. Juvenile coachwhips are not often seen and probably are much more secretive than the adults.

As a general rule the coachwhip makes a poor species for observation in captivity. Many will accept food readily enough but usually remain very nervous and seldom submit to handling.

NORTH CAROLINA WILDLIFE

RESOURCE-O-GRAM

A ROUNDUP OF THE LATEST WILDLIFE NEWS

February Ends Long Hunting Season

Tarheel hunters have been banging away at sundry species of game since last September 11 when the dove season opened, but with the end of February all seasons on game will be closed. In general, the hunting seasons were excellent except in the case of waterfowl, where a shortage of birds combined with mild weather to greatly reduce this season's kill.

Habitat Restoration Materials Ready

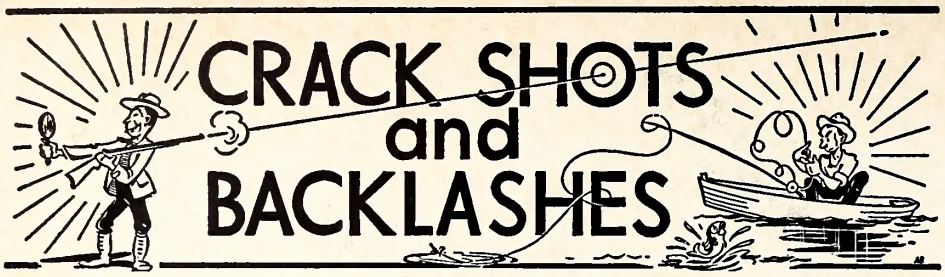
Shrub lespedeza and other wildlife habitat restoration planting materials are ready for free distribution to farmers. Applications for these materials may be made to local Extension and SCS offices, district biologists, and from Division of Game, Box 2919, Raleigh 27602. Persons wishing to participate in the State's habitat restoration program are urged to make application early. Materials, including sericea lespedeza seed, annual food mixture packets, and multiflora rose seedlings, plus shrub lespedeza seedlings, will be distributed on a first come, first served basis.

Hatcheries Ready to Stock Trout

Some 700,000 keeping-size mountain trout have been produced in Wildlife Commission and Federal hatcheries for distribution to some 2,000 miles of trout streams open to public fishing. Much of the stocking will be done prior to the trout season set to open April 2.

Tarheel Outdoor Press Association Organized

About 15 outdoor writers assembled in Pinehurst recently to reorganize the inactive N. C. Outdoor Writers Association and came up with a similar organization now designated "Tarheel Outdoor Press Association," called TOPA for short. Membership eligibility requirements are the same as those for the Outdoor Writers Association of America, and annual membership dues are $3.00. The TOPARs are scheduled to meet in Raleigh on February 25 in connection with the N. C. Wildlife Federation Annual Meeting. Bodie McDowell, Greensboro News, is President, Tom Higgins, Charlotte Observer, is vice president. Rod Amundson, Wildlife Magazine is secretary-treasurer.



DEPARTMENT OF LETTERS TO THE EDITORS, FIELD NOTES, AND ITEMS OF INTEREST

Conducted By Rod Amundson

Most people think of woodpeckers as rather harmless birds that run up and down tree trunks and make a great deal of noise, especially when they are trying to sleep late in the morning.

Others think of woodpeckers as nuisances that bore holes in valuable trees. Too many others consider them useless critters that make good targets for BB guns and .22 rifles.

To a forester, or to a forest owner, woodpeckers are among the most valuable of our wildlife species.

Let's get that hole-boring thing straight first. Woodpeckers do not bore their nest cavities in living trees;—only dead ones that are otherwise useless except possibly for firewood. Furthermore, squirrels and bluebirds have found that abandoned woodpecker holes make excellent places to live in and rear their families.

When you see a woodpecker obviously boring into a live tree, chances are ten to one that he is saving that tree's life. In the case of a pine tree the odds are 100 to 1 that he is drilling for the larva of a southern pine beetle. That is important.

The southern pine beetle has been a plague on pine trees in our region for many years. A severe infestation of pine beetles can wipe out pine forests almost as fast as a forest fire in a high wind. Without woodpeckers to patrol our piney woodlands, the problem of controlling pine beetles would be ten times what it is now. Any forester will tell you the problem is serious.

Woodpeckers feed almost exclusively on insects, most of which are harmful. Of themselves they are harmless and for the most part colorful. Noisy? Yes. But the woodlands would never be the same, in more ways than one, without them.

The largest of the woodpeckers, the piliated, created these den holes.

This is a red-bellied woodpecker looking for a meal. These birds are beneficial.

Bear Facts

DEAR SIRS: The August issue of **Changing Times** contains an article "The Ins And Outs of Bears."

I quote from the article, "More bears are found in roadside cages for the amusement of tourists than any other mammal according to Defenders of Wildlife. An official of the organization lists North Carolina as the state most guilty of displaying bears in such inhumane manner."

After reading this, several thoughts and questions came to mind. Were you aware of this? What is unique about N. C. laws, or the people or the availability of bears in N. C.?? Do you plan on doing anything about the situation? Perhaps because you have the most bears in cages, in reality it may be very few?? I'm trying to say that if all states had one bear caged, and you had two, you would have the most, but still not a large number caged.

I thought that the subject would be of interest to you, and perhaps make an interesting article for your excellent magazine.

It seems to me that the format of your magazine has improved this year a great deal. I find that your articles on nature have had more interest to me, than in years past. MAJOR W. A. MUNBY, BETHESDA, MD.

The North Carolina Wildlife Resources Commission has established regulations controlling the keeping of wildlife in captivity. These regulations are established within the limits set by North Carolina statutes and specify the size of cage required per animal for each species, the sanitation standards, and the food, water and rest facilities to be furnished. Currently, twenty individuals hold permits from the Commission to keep a total of 31 bears in captivity.—Ed.

Rifle Story

DEAR SIRS: Could you please tell me the legality of using a "high-powered" rifle such as a 30.06 for hunting in the State of North Carolina? There is much controversy here on this subject. Please indicate which counties do and do not permit the use of such rifles and settle our argument once and for all. JAMES R. HALL, CHERRY POINT

I should like to advise that in most counties in North Carolina there is not restriction of the kind of rifle which can be used for taking game. There are, however,

some exceptions. They are as follows:

1) In Hoke County, it is unlawful to hunt deer with a rifle.
2) In Richmond and Scotland Counties, it is unlawful to hunt deer with a rifle larger than .22 caliber.
3) In Gates County, it is unlawful to hunt any wild animal with a rifle larger than .22 caliber.
4) In Dare County, the possession of rifles on Roanoke Island and east of U. S. Highway 158 is unlawful except when stored in a residence or place of business or while being transported to and from use elsewhere.
5) On managed hunts on Wildlife Resources Commission Management Areas, special regulations govern the types of firearms which may be used. On most of these areas, conventional or semi-automatic rifles .243 caliber or larger may be used for taking big game and only .22 caliber rimfire may be used for small game hunting.
6) Federal regulations prohibit the use of rifles for taking of migratory birds.

Robert B. Hazel, Chief
Division of Protection

Gamebirds For Sale

DEAR SIRS: Enclosed find a check for $1 for a gift subscription to start in December.

In answer to B. Crump's letter on page 26 of the November 1965 issue—young gamebirds are obtainable (with a federal permit) from Stromberg, Hatchery, Fort Dodge, Iowa. Among other varieties they have Canadian geese, wild turkeys, etc. Their catalogue and price list is obtained by writing to them and including 35 cents for the catalogue.
BARBARA M. KEITH, DURHAM

$100 Award In Ornithology

In order to stimulate research in the field of ornithology through the use of *bird banding* techniques or available banding data, the EASTERN BIRD BANDING ASSOCIATION makes an award of $100 to a student, undergraduate or graduate, who uses bird banding in an ornithological study.

Applications:

The student merely writes a letter requesting consideration. His letter must be accompanied by a description of his project and must explain how he uses bird banding. His description must be signed by the head of his department.

Qualifications:

The college or university must be within the United States.

If the applicant is an *undergraduate,* he must: be either a junior or senior; major in zoology or biology; earn at least a B average; *use bird banding as part of his research.*

If the applicant is a *graduate student,* he must major in ornithology, and he must *use bird banding as part of his thesis.*

Although the Eastern Bird Banding Association would like to publish any papers which the recipient may write as a result of his studies, this is not a prerequisite.

Time limitation:

The student's research description should be submitted prior to January 1, though an application received within reasonable time thereafter may receive consideration.

ADDRESS APPLICATIONS AND QUESTIONS TO: Albert Schnitzer, Chairman, Memorial Award Committee, Eastern Bird Banding Association, 155 Wild Hedge Lane, Mountainside, New Jersey.

Between the *Wildlife* Bookends

Fishing Encyclopedia

"From the 6,000 foot peaks of the Great Smokies to the surf-splashed beaches and beyond, North Carolina is blessed with abundant waters and quality angling. . ."

So starts an article of nearly 5,000 words about North Carolina's superb fishing in McClane's Standard Fishing Encyclopedia and International Angling Guide.

The fishing wonders of the state are described in detail, as to where and when to go and what to expect in scores of great fishing spots on streams and lakes and along a coast famous all over this country.

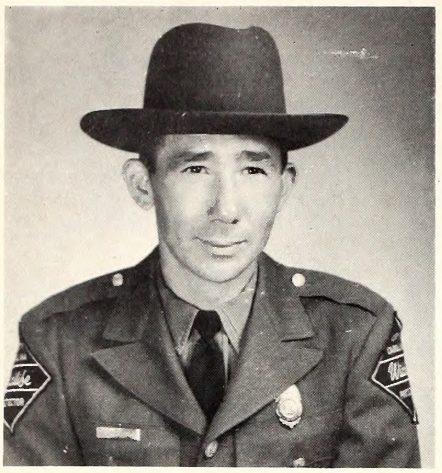
The Encyclopedia carries the article, one of the longest in the book, as a top feature about a state which has maintained its fishing peak at a point almost second to none.

The massive volume on fish and fishing all over the world—approximately a million words in 1,088 pages—was edited by Al McClane, fishing editor of Field and Stream Magazine and published by Holt, Rinehart and Winston, Inc. of New York. McClane also is among 141 outstanding scientists and anglers who contributed to perhaps the finest such book ever produced.

It leaves little to be said about fish and fishing anywhere—including in North Carolina with some of the finest trout streams and bass ponds in the east and salt-water fishing of all kinds including some of the best for the striped bass.

The article misses none of the better fishing anywhere in the state.

KNOW YOUR PROTECTOR



Henry L. Barber

Henry L. Barber, Brunswick County Wildlife Protector, was born April 20, 1933 in Chatham County. He is the son of Mrs. H. L. Barber of Goldston, North Carolina, and the late Mr. Barber. Mr. Barber graduated from Goldston High School and spent two years in the Army stationed in Fort Sill, Oklahoma. Prior to employment with the Wildlife Resources Commission, Barber was a machinist with Saco-Lowell Shops in Sanford, North Carolina.

Barber completed the Pre-service Training School for Wildlife Protectors at the Institute of Goverment in Chapel Hill in 1958. On June 15, 1960, he was assigned to Halifax County as a Protector Trainee. On August 26, 1960, he was transferred to Leland in Brunswick County. Since his initial employment, he has completed four In-service Training Schools.

Barber is a member of the Southeastern Association of Game and Fish Commissioners, the Brunswick County Peace Officers Association and the Leland Junior Chamber of Commerce. He is married to the former Shirley A. Jeffries of Gulf, North Carolina and has two children, Mitchell nine and Kathy four. The Barbers are members of the Bethlehem Methodist Church in Gulf, North Carolina.

DIVISION ENFORCEMENT RECORD FOR NOVEMBER, 1965

HUNTING & FISHING	
Persons checked	31,165
Total prosecutions	725
Total convictions	698
Total cases not guilty	9
Total cases nol prossed	5
Total cases dismissed	3
Total fines collected	$5,632.55
Total costs collected	$5,854.03

BOATING	
Boats checked	500
Total prosecutions	50
Total convictions	49
Total cases not guilty	0
Total cases nol prossed	0
Total cases dismissed	0
Total fines collected	92.50
Total costs collected	$389.20

All fines and any arrest or witness fees are paid into the school funds of the counties in which the violations occurred, and no part of the fines or costs collected are paid to the North Carolina Wildlife Resources Commission or its personnel.

Extinction Or Survival?

Word comes from one of "Wildlife's" contributing artists, Bob Shell, about the Jersey Wildlife Preservation Trust. This United Kingdom organization headquartered at Jersey, Channel Islands, uses at its symbol the Dodo. The aims of this international group include the study of world wildlife species whose numbers are now endangered, and to provide them with sanctuary to aid in their survival.

For more information about this group and membership in it, write to R. Shell, 1437 Aspen Street, N. W., Roanoke, Virginia, 24017.

TROUT STREAM

• continued from page 7

associated with grazing, mining, and development and settlement.

- Encourage life history studies on trout and associated fish species in these streams.
- Improve communication among people presently managing this resource by stepping up publications, sponsoring symposiums, and providing wider distribution of existing and future unpublished progress reports.

Thomas H. Ripley
Claude E. Hastings
Price Wilkins
Charles E. Lane, Jr., Chairman

WOOD DUCK

• continued from page 23

Wood duck colonies often can be developed from a single nesting pair to a dense colony over a period of years. One outstanding example is the nesting colony established by Dr. F. Eugene Hester of N. C. State University. In the summer of 1953 he erected one nest box in a small swamp on his father's pond. During the following spring a wood duck nested in the box. This success stimulated Dr. Hester to erect a few more boxes. Each year a few more ducks nested and a few more boxes were added. Dr. Hester has gradually increased the number of boxes on or around his eight-acre pond as the nesting population increased. During the spring of 1965, 46 of his 60 boxes were used by wood ducks. This heavy nesting density shows how well the wood duck can respond to management in North Carolina. You do not have to own a farm pond in order to participate in a wood duck nest box program. Perhaps a relative or friend has a suitable pond and would be willing to cooperate with you. If not, there are numerous places where nest boxes can be erected. Public and private millponds, lakes, rivers, and other bodies of water offer possibilities. Of course you must have the owner's permission before you begin a program on private land. Explain the importance of your project to the owner and seek his full cooperation. Solicit the help of other interested persons if you feel that a nest box program is more than you can handle alone. Valuable contributions to wood duck management can be made by sportsmen's clubs, nature clubs, 4-H and FFA organizations, and Boy Scout troops.

The human population explosion has succeeded in destroying vast amounts of wildlife habitat by penetrating wilderness areas

with highways; draining wetlands; polluting soil, water, and air, and by indiscriminate use of insecticides and pesticides. All of these things have been done in the name of some kind of "progress." Sometimes we fail to realize that that which we destroy is better than the conditions we create. We exercise great destructive power against our environment. Unless checked by a greater understanding and appreciation for our environment, we will succeed in destroying natural resources that can never be replaced. We must learn to fit our needs to our environment and at the same time refrain from robbing our environment of its naturalness. We must gain an insight into the effects of our own actions. Only by attaining a greater sense of values for all of our natural resources can we continue to thrill to the whistling of wood ducks as they wing their way across the stillness of a predawn tomorrow.

BILL HUSKINS

Last November, Ducks Unlimited, represented by its Executive Secretary, (left) Lawrence J. Durkin, honored Gov. Dan K. Moore with a commendation for the support and leadership our State has shown in the waterfowl program nationally. Senator Herman K. Moore presents the symbolic pin to Gov. Moore.

CREEL CENSUS

• **continued from page 25**

for the largest harvest of catfish taken by any single license category. However, these data also show that if all rod-and-reel catfishermen are lumped on the basis of whether they do, or do not, have some type of license, then the licensed fishermen are found to harvest more catfish than do all classes of unlicensed anglers.

These facts concerning the rod-and-reel harvest of catfish from North Carolina's inland waters indicate that today, the catfish stands in much the same position as did the black bass during the late 1920's when it became apparent that its value as a sports fish had overtaken its commercial importance. The time is close, if it has not already arrived, when the catfish should be seriously considered as a worthy candidate for full game-fish status.

Table 9-E

License Status	Percentage of Statewide Catfish Rod-and-Reel Catch Taken by License Category
Licensed:	
Statewide Fishing	23.4
Combination	19.5
County Resident	2.7
One-day Resident	5.6
Nonresident	1.8
Subtotal Licensed Anglers	53.0
Unlicensed:	
County Resident Natural Bait	44.4
Landowner	< 0.1
Minor	2.6
Subtotal Unlicensed Anglers	47.0

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New Address_____

Zip Code_____

IMPORTANT:

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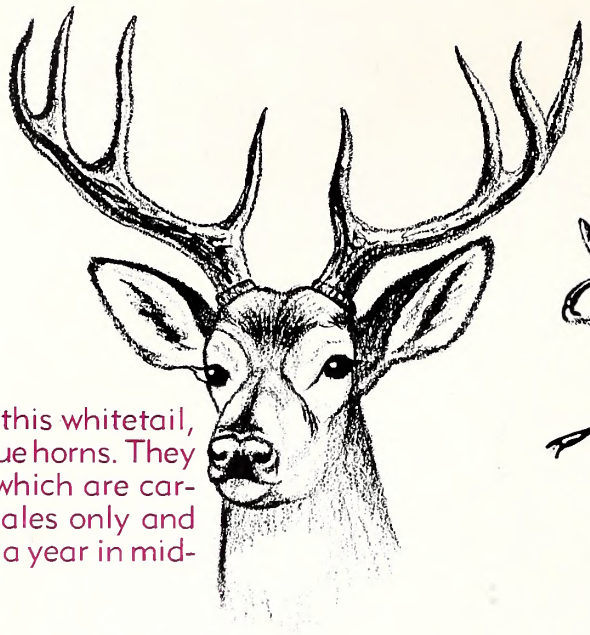
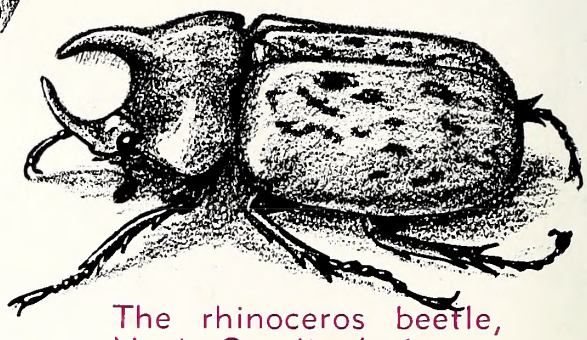


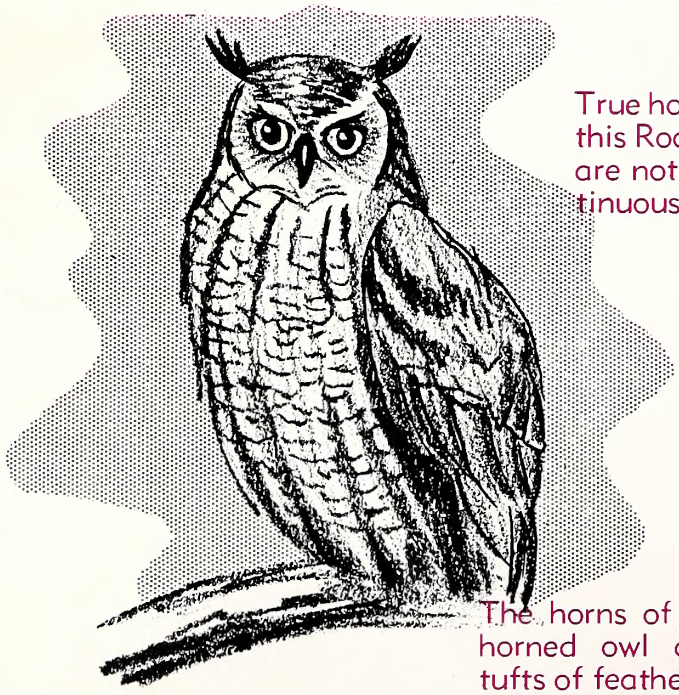
Deer, such as this whitetail, do not have true horns. They have antlers which are carried by the males only and are shed once a year in midwinter.



The rhinoceros beetle, North Carolina's largest beetle, has a pair of impressive "horns". Their use? Probably simply to scare his opposition.

Wildlife With Horns

True horns, such as those of this Rocky Mountain sheep, are not shed but grow continuously from year to year.



The horns of the great horned owl are really tufts of feathers.

The catfish family's horns are actually harmless sensory barbels used to detect food and vibrations.

Shell 65

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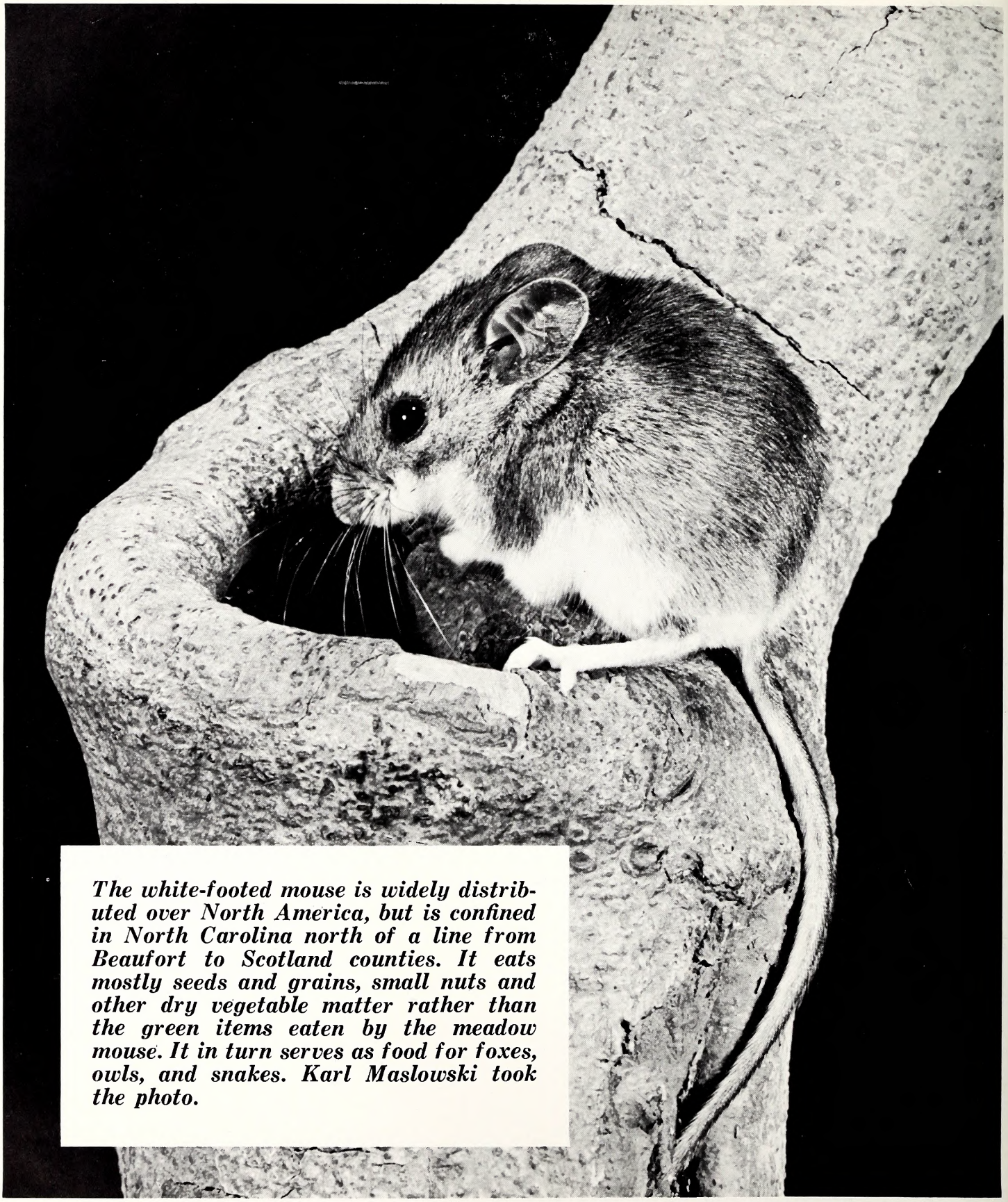
Wildlife IN NORTH CAROLINA

MARCH, 1966



The white-footed mouse is widely distributed over North America, but is confined in North Carolina north of a line from Beaufort to Scotland counties. It eats mostly seeds and grains, small nuts and other dry vegetable matter rather than the green items eaten by the meadow mouse. It in turn serves as food for foxes, owls, and snakes. Karl Maslowski took the photo.

STATE OF NORTH CAROLINA

DAN K. MOORE
GOVERNOR

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WILDLIFE IN NORTH CAROLINA recognizes the need for close cooperation between State and Federal conservation agencies and the people who hunt and fish—to bring about a restoration of our renewable resources. The Editor gratefully receives for publication news items, articles, and photographs dealing with the North Carolina out-of-doors, but reserves the right to reject materials submitted. Full credit is given for all materials published.

* * *

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* * *

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Wildlife IN NORTH CAROLINA

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LUTHER PARTIN - - WRITER-PHOTOGRAPHER
JOHN PARKER - - - - - OUTDOOR SAFETY

Much of North Carolina's wildlife wealth lies hidden from view except on rare occasions. One of the species that few of us see in the wild is the American alligator. Yet it is a solid citizen of the Tarheel coastal swamps. Legislation enacted last year makes it illegal to take or attempt to take alligators by any means in North Carolina. The 8-footer on this month's cover was painted by Tom Hale.

What Happens to Wood Duck Habitat?

by Donald J. Hankla and Vernon E. Carter
U. S. Bureau of Sport Fisheries and Wildlife
Atlanta, Georgia

FOREST management and other land use activities are having an impact on wood duck habitat in the Southeast. But because wood duck populations defy inventory, and their habitat has not yet been defined quantitatively and qualitatively, there is no way of accurately assessing the impact of forest management and other human activities on wood duck habitat. It is possible, however, to assess, in general terms, the magnitude of some of the practices that are affecting what we consider to be wood duck habitat in the Southeast. From available information some general conclusions can be drawn regarding the impact of forest management and other human activities on the bird and its habitat.

Much of the supporting information for this report was obtained through personal contact with several resource managers. To each we express deep appreciation for their assistance.

Southeastern Wood Duck Habitat

In order that a discussion of practices and activities relating to wood duck habitat might have meaning, we believe it is necessary to first establish a concept of what constitutes wood duck habitat. A search of the literature revealed about as many terms used to describe wood duck habitat as there are biologists and naturalists that have written about this web-footed bird of the wetland forests. Phrases such as "overflow hardwood bottomlands", "margins of sounds," "open places in swamps," "rice-field ditches," "sequestered forest ponds," "brushy timberland sloughs," "shallow marshes," "shrubby swamps," "woodland ponds," "old mill ponds," "beaver ponds," and other similar terms describe what is generally recognized as habitat preferred by wood ducks (Kortright, 1943; Wray and Davis, 1959). If this is a true reflection of the variety of ecological types preferred by wood ducks for feeding, nesting, rearing, resting, and roosting, then the impact of forest management and other human activities on southern wood duck habitat is staggering.

Habitat losses of both a direct and indirect nature have been occurring at a rapid rate, particularly since the end of World War II. Drainage, clearing, flood control, pollution, and intensive forest management are responsible for a widespread reduction in wood duck habitat in the Southeast.

Adverse Habitat Factors

Drainage: This is thought to be the undisputed worst enemy of the wood duck. Drainage is directly responsible for the destruction of oxbow lakes, sloughs, swamps, beaver ponds, woodland ponds, and marshes that are so necessary for rearing, resting, and roosting. Where drainage does not directly affect such surface water areas, it can and often does reduce or eliminate seasonal flooding which is so necessary to replenish these wetland water supplies following periods of drought.

Drainage also affects wood duck habitat by reducing the frequency and duration of flooding, and by lowering the groundwater table. Timber stand conversion is encouraged, usually toward forest types which are tolerant of, or require drier soil conditions. Hardwood sites may be converted to pine sites, and lowland swamp type hardwoods are replaced by hardwoods which respond to better drained soils. In local situations this can be beneficial, particularly when stands of cottonwood and willow are succeeded by heterogenous stands of hardwoods which contain Nuttall oak (laurel oak in the Southeast), sweet gum, willow oak, water oak, green ash, red maple, elm, and sycamore. Most often, however, losses from stand conversion exceed gains. Stands of cypress and tupelo gum, which often provide quality wood duck habitat, are lost because these species fail to reproduce under better drained soil conditions. Drainage promotes stand conversion and it also promotes land clearing.

Clearing: Clearing ranks high

This is a report which was given at a wood duck symposium co-sponsored by the Wildlife Management Institute and the North-central Section of the Wildlife Society. Copies of the proceedings are available at a nominal cost from the Wildlife Management Institute, 709 Wire Building, Washington, D. C.

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as an enemy of the wood duck. Hardwood timber is one of the most important ingredients of wood duck habitat. The removal of hardwoods through clearing effectively destroys the potential of an area to provide nest sites and important food in the form of mast, both of which are necessary components of wood duck habitat.

Flood Control: Food control adversely affects wood duck habitat in the Southeast, both directly and indirectly. Flood control reservoirs strategically located in major drainages reduce flooding in downstream areas, thus reducing the frequency and duration of inundation on large acreages of flood plain hardwoods. Hardwood mast, an important winter food for wood ducks, cannot be utilized because shallow flooding is necessary to make the mast available. Flood control is also a major factor contributing to clearing and removal of these bottomland hardwoods. Landowners are encouraged to clear woodlands for agricultural uses because flooding following reservoir development occurs less frequently in the flood plain below the reservoir. Reservoirs also flood out habitat within their immediate basins, thus removing trees that provide nest sites and inundating shallow surface water areas that are valuable for rearing and roosting.

Pollution: Pollution in the form of chemical effluents, municipal sewage, and/or silt effectively renders many backwater sloughs, sluggish streams, rivers, and bays unsuitable as rearing habitat for wood ducks. Chemical wastes and turbid waters eliminate or seriously reduce aquatic plants and associated insect life that are the primary source of food of young wood ducks during the first several weeks following hatching.

Another form of pollution which is believed to affect wood duck habitat is the concentration of pesticides in streams and rivers. Many natural drainageways in the Southeast carry agricultural and industrial pesticides from a wide area of influence and concentrate them in a relatively small area. There is strong evidence that food chain organisms in pesticide-laden streams are adversely affected, a phenomena which can in turn affect higher organisms such as the young wood duck.

Forest Management: This activity is treated last because it is difficult to appraise as a factor bearing on wood duck habitat in the Southeast. In a general survey of timber interests, we noted that several timber products companies are conducting little more than a high grading program, which in its present form is actually beneficial to the wood duck. Other companies are managing more intensively, but admit that it is not economically feasible to remove all cull trees and grow only straight-stemmed sound trees with no cavities. Still other companies have engaged in drainage and hardwood removal in an effort to convert low grade hardwoods to pine. This type of management is the most damaging to the wood duck for it results in the complete destruction of habitat even though such habitat may be only of a seasonal nature.

Effects of Land and Water Use Activities

In gathering data which relate to the magnitude of the practices just discussed, our efforts were largely confined to the Bureau of Sport Fisheries and Wildlife 12-state southeastern area, which includes Louisiana, Arkansas, Kentucky, Virginia, Maryland, and all states located to the south and east. Within this area, alluvial bottoms, hammocks, and swamps which support practically pure stands of hardwood timber, constitute the best remaining wood duck habitat. Wooded wetlands also provide fair to good quality habitat during years when above normal rainfall produces shallow flooding. The impact of drainage, clearing, flood control, pollution, and forest management on this habitat can best be assesed by reviewing some of the programs of public and private land and

What makes good wood duck habitat? These colorful waterfowl will use many different types of watery situations.

Permanent swamp areas like this offer one of the most preferred living areas. Habitat of this type is on the decline.

JOEL ARRINGTON

water management agencies.

Drainage of Industrial Forest Lands: Timber companies and private landowners are engaged in a massive program in the Atlantic and Gulf coastal plains to place certain less productive wetland types in commercial timber production. Klawitter (1965) states that the practice of woodland drainage in the coastal plain began only about 18 years ago when a ditch was dug through low-value brush, hardwoods, and cypress to demonstrate that the removal of surface water would permit slash pine seedlings to grow in areas formerly too wet for them. From that beginning, woodland drainage in the Atlantic and Gulf coastal plains has increased, until now an estimated two million acres of wetlands are under this form of management. An additional four to five million acres of low value coastal plain wetland forests exist that offer drainage and conversion opportunities, with certain limitations. These types provide only marginal habitat for wood ducks, being used largely during spring and fall migration. While the impact of their loss would not appear to be great, the cumulative value of these areas as feeding, resting, and roosting habitat may be surprisingly high. Drainage of this type will continue as the demand for forest products increases and creates a more favorable benefit-cost ratio.

Small Watershed Program: Programs of greater magnitude which have the potential for influencing virtually all wood duck habitat in the Southeast are the Small Watershed Program authorized under the Watershed Protection and Flood Prevention Act, P.L. 566, and its predecessor, the Pilot Watershed Program. These programs authorize the Secretary of Agriculture to cooperate with state and local agencies in planning and carrying out works of improvement for soil and water conservation. These works include flood retarding structures, stream channelization, clearing and snagging stream channels and banks, and land treatment measures for maximum control of runoff. As of November 1, 1965 in the 12-state Southeast area, a total of 382 applications covering 23,169,400 acres—nearly seven percent of the total land—had been authorized for planning assistance under the small watershed program (U. S. Department of Agriculture, 1965). Of this number, 262 plans covering 15,045,500 acres have been approved for operations (construction). Under the Appalachia Program, the Department of Agriculture plans small watershed development on more than 400 Appalachian watersheds.

Drainage is an important aspect of the program, and in many instances the lands to be drained provide at least seasonal, if not year-round, habitat for wood ducks and other waterfowl. Unless adequate provision is made to mitigate losses sustained from drainage, the Small Watershed Program will be very damaging to the wood duck.

The North Carolina Wildlife Resources Commission made a study in June 1964 of three P.L. 566 projects which were installed in the eastern part of the State and reported that each has been highly destructive to wetland wildlife (Barick, 1965). According to the Commission, "Of several projects currently in the planning or active state, we can point to none for which the final approved plans include adequate provision for the protection of wetland wildlife resources." The Commission report suggests that if the same pattern of operation continues in the future, P.L. 566 projects scheduled for eastern North Carolina threaten extensive and serious damage to several species of wildlife important to the recreational potential and economy of the region.

Clearing by Public and Private Agencies: Another factor which has been identified as destructive of wood duck habitat is clearing. The magnitude of this practice is not easily assessed, although its influence is totally adverse to the wood duck. In the Southeast as a whole, it has been estimated that by the year 2,000, 13.4 million acres of existing forested wetlands will be converted to cropland and pasture. In Arkansas, Louisiana, and Mississippi the clearing of hardwood bottomlands is particularly extensive. A Department of Agriculture report revealed that of 1,939,600 acres of bottomland hardwoods presently occurring in the White River Basin in Arkansas, only about 740,100 acres, or 31 percent, will remain in this type by the year 2000. Landowners in the White River Basin, as well as elsewhere in Arkansas, Louisiana, and Mississippi, are clearing bottomland hardwoods to plant soybeans. Growing soybeans on lands previously occupied by bottomland hardwoods is a change brought about by recent advances in soil technology. Soybeans provide a greater economic return than timber, and are an important export product. Unfortunately, they are not a substitute for hardwoods, and the loss of excellent wood duck habitat in the three-state area will be extensive.

Corps and Private Flood Control Projects: The impact of flood control on wood duck habitat is probably greater in the Southeast than in any other section of the nation. According to a 1956 survey, there are 59 lake and reservoir projects in the 12 southeastern states that have flood control as either a primary or secondary function (Thomas and Harbeck, 1956). These do not include municipal, power, or navigation reservoirs which also function, at least in part, as flood control projects. Additional projects are planned under the Appalachia Program.

The 59 areas collectively cover about 2,420,720 surface acres and influence an area in the downstream flood plains several times greater. The area occupied by lakes and reservoirs is largely lost as wood duck habitat and the habitat in the flood plain is greatly reduced, both in quality and quantity.

The influences of flood control in various flood plains are manifest by reduction in frequency and duration of flooding, clearing of hardwood bottomlands, and reduction in size or complete elimination of oxbow lakes,

sloughs, and swamps that serve as wood duck production and wintering habitat. These losses are considered to be irretrievable.

Pollution: While the impact of pollution as a factor affecting wood duck habitat is very difficult to measure, there is little doubt that it has made serious inroads into otherwise suitable wood duck habitat. In the Southeast there are hundreds, or perhaps thousands, of miles of streams that would be suitable as rearing habitat for wood ducks if they were not polluted with various dyes, detergents, and other chemical compounds. While a concerted effort has not been made to appraise the extent of pollution of wood duck habitat, we have observed several miles of polluted streams uninhabitated by wood ducks during the spring when broods should have been present. Broods were observed on unpolluted streams with similar habitat characteristics. During the migration and wintering season wood ducks and other migrants seem to show no particular preference between polluted and non-polluted streams. An encouraging aspect of the pollution problem is that habitat losses as a result of this factor may be regained once the pollution has been abated. Because of the need for clean water for human consumption and other uses, it is expected that pollution, as it now affects wood ducks, will be less of a problem in future years.

Forest Management: The impact of forest management on wood duck habitat is not of great significance, except where hardwood lands are converted to the production of pine. As previously mentioned, it is estimated that two million acres of low value hardwood lands have been drained in the Atlantic and Gulf coastal plains and converted to pine. The actual value of these lands as wood duck habitat varies from one locality to another, and the total impact of the program on wood duck habitat is a matter of conjecture.

In general the owners of hardwood bottomlands have not yet begun broad scale intensive management of the type that will adversely affect wood duck habitat. Management practices, such as the removal of all trees that contain cavities, drainage to improve site classification, and drainage of woodland ponds and swamps, could do great harm to the habitat. Fortunately, it is not economically feasible to enter into this type management at this time.

Summary

Destruction of wood duck habitat has come about as a result of changes in the environment that man has promoted in an effort to better himself through more intensive utilization of certain resources. These changes, of necessity, came about at the expense of other resources, which in man's judgment were of lesser value. In many instances man's judgment regarding the relative values of various resources has been misguided. Some of his efforts have been successful and some have compounded his problems. Change, however, is the story of America and one reason for this country's greatness. To keep pace with the times, more changes are in order and will continue to be made.

We think it is time to take stock of what is left in the way of wood duck habitat and make an all-out effort to convince those persons responsible for land and water management that wetlands habitat is valuable and is worth preserving. To do less is to contribute to the loss of the wood duck—the Southeast's only widely distributed native species of waterfowl. To accomplish this goal, values will have to be given to fish, wildlife, hardwood timber, and water; values that are high enough to deter drainage, clearing, flood control, and pollution of wood duck habitat.

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The value of undisturbed swamps is often underestimated. Even after heavy rain (2.3 inches) this swamp run shows only clear water. Tupelo timber and water storage as well as wildlife habitat make such wetlands of great value.

LUTHER PARTIN

School Camp

Staff Photos

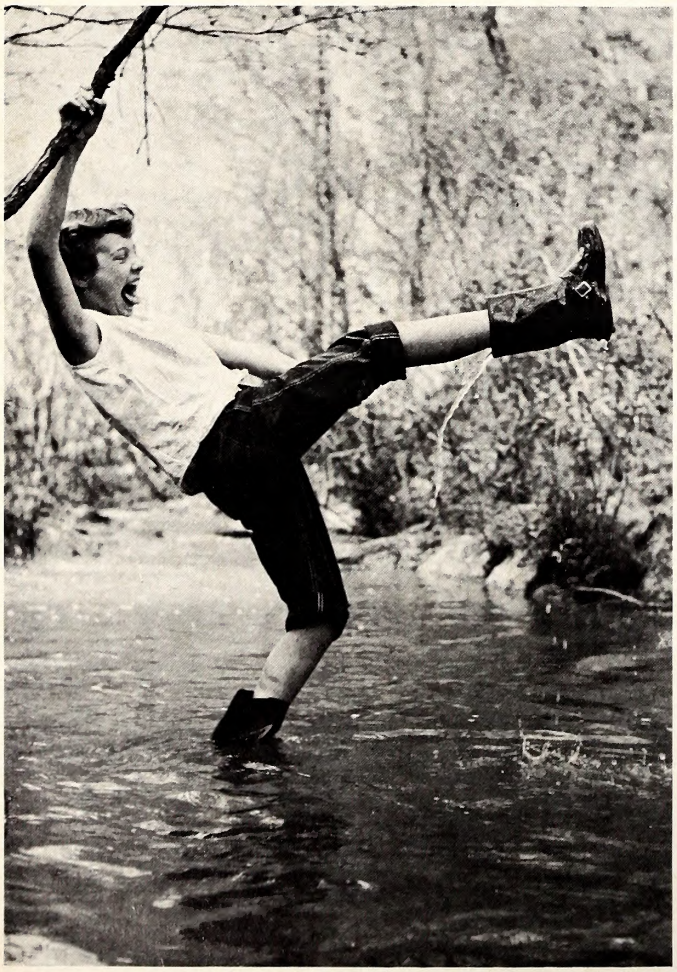
Text by Lunette Barber

How can we conserve the natural resources of America and enjoy them too? Education from kindergarten to scientific research is a great help. Outdoor recreation is stressed throughout America today and much money is spent to promote the program. Also much is said about physical fitness and safety which pertains to the open spaces. How is the youth of the land going to know enough about the out-of-doors to want to conserve the minerals, soil, water, plants, and wildlife and appreciate them too without some knowledge of their importance? It is too bad that we spent $600,000,000 annually in recent years to clean up litter in this great land of ours when we should have been singing proudly "America the Beautiful." It has been stated authoritatively that $3,000,000 would be required to take care of litter on North Carolina's highways annually if properly done.

Three good ways to create interest, appreciation and learn about the out-of-doors with children are **field trips, nature trails**, and **school camps.** North Carolina is far from leading in outdoor education. It seems that a course in Conservation of Natural Resources would be a must for teachers and would be very beneficial.

Field trips can be a beginning, proper use of nature trails can help, and school camping can be most beneficial and rewarding in teaching conservation, outdoor recreation, and safety. School camping is not accomplished though, by wishful thinking. It is hard work and much responsibility. Greensboro leads in this state and has for 14 years at Umstead Park. The fifth grade children spend an entire week there with the greatest stress on the outside. Madison-Mayodan schools spend two days annually for outdoor study and call it Science Camp. One section of the fifth grade at Wentworth spends one week at a scout camp nearby; and two sections of grade six from a Durham school spend two days at Umstead State Park with the same procedure.

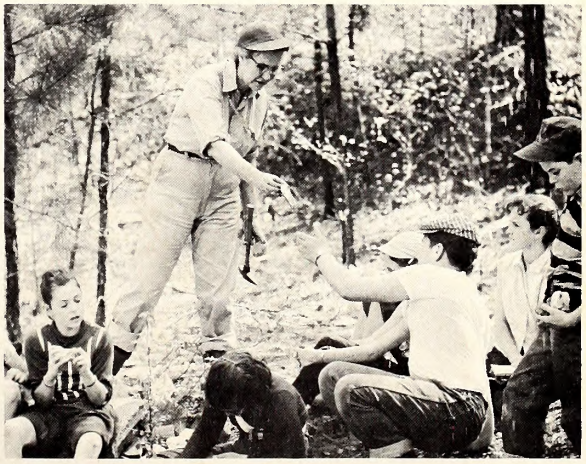
That is a small and slow beginning for over a million children in North Carolina. This is the time for an awakening for this type of education—whether it is called "quality education" or something else!



The "feel" of Nature is something that is available only in the outdoor classroom. Conservation comes alive when youngsters become part of it. By combining fun and learning, school camps provide the basis for becoming conservation minded.

This fire tower will be remembered for its endless steps if for nothing else. Protection of our forests and other renewable resources as well as their wise use is stressed in these outdoor experiences. It takes careful planning and dedicated teachers.

It's usually an easy matter to catch and hold the attention of youngsters when studying Nature. The group below enjoys a time of quiet around a fire. Spring is an ideal time for school camp. Some fast net work (right) helps in the pursuit of insects.



An egg-laden crayfish is a rare find that will serve as a "show and tell" project at the week's end. In a well-rounded natural resource study program, rocks and minerals receive attention (above). But the nearby creek or lake is the attraction that youngsters find hard to leave. (left)

Oscar

by David Brinning
photos by the author

AN unusual pet lives at the home of a University of North Carolina professor. Although it is unusual enough that it is a timber rattlesnake, an even more extraordinary fact is that the snake, named Oscar, is the oldest rattlesnake in captivity. He is the recorded ripe old age of 27. Actually, Oscar is somewhat older than this, as age only counts for the record from the time he was captured. The longevity record held by Oscar has been verified by Charles Shaw, Assistant Director of the San Diego Zoo, who is an expert and keeper on the records of reptiles.

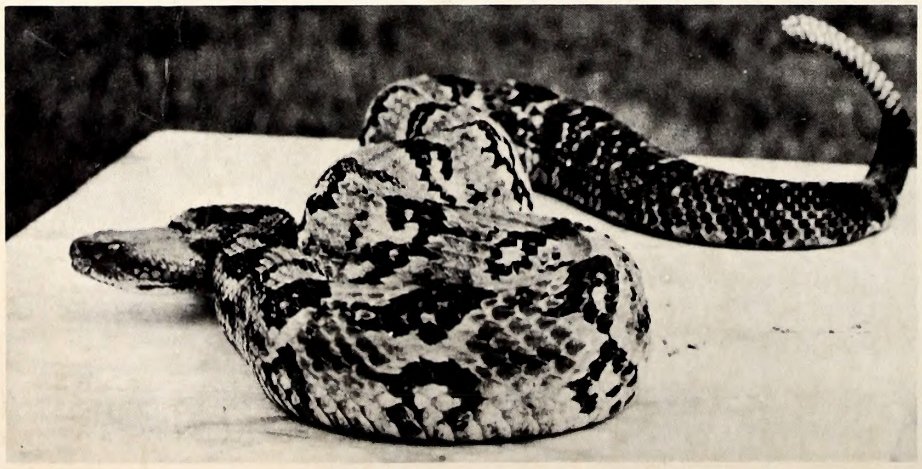
During the winter, Oscar is a guest in the basement of Dr. Herbert Hechenbleikner, Professor and Chairman of the Biology Department at the University of North Carolina at Charlotte. However, on occasion during the warm weather, Dr. Hechenbleikner will lift Oscar from his outdoor cage, place him in a large bucket and carry him to the front lawn to sun himself or to just slither through the grass. Sensing danger, Oscar will head for cover and Dr. Hech, as he is known to students and friends, has to retrieve him before he reaches the bushes and possible escape.

A companion to Oscar, named Rudolph, died at the age of 24 years and seven months. Dr. Hech now has Blackie, a dark phase timber rattlesnake, to keep Oscar company.

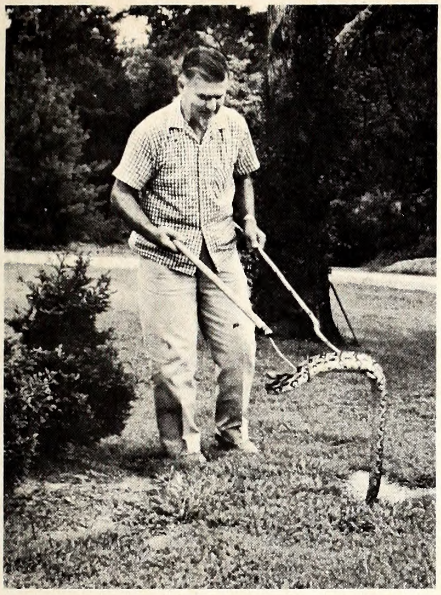
Oscar generally dines on rats about twice a month, but has gone three to four months without eating. Occasionally, when the Hechenbleikner family cat goes out on the prowl at night and catches a small four-legged "critter," she will deposit her catch on the Hechenbleikner's backdoor step. When this happens it may afford a slight change of pace in Oscar's and Blackie's diet.

When Oscar is hungry, he will become more active than usual, roaming over his cage looking for his next meal. At feeding time, if hungry, he will strike, wait for the venom to do its work, then proceed to swallow the victim. Dr. Hech has noticed that rats struck one day and not eaten were still limp the next day. Something in the snake venom apparently delays rigor mortis, thus making swallowing easier for the snakes.

In the summer, Oscar and Blackie live in a large outdoor cage and in winter a smaller indoor cage. These cages have double fine mesh screen so that



This is Oscar, a distinctively marked timber rattlesnake in a "striking" pose. He displays his 15 rattles which buzz out a warning. He means business.



Beginning at top left, this sequence shows Dr. Hechenbleikner deftly using two snake sticks to remove Oscar from his cage, and then place him in a pail.

the snakes can't possibly strike through, and too, so that children can't poke their fingers through. In addition to this, the doors to the cages have heavy padlocks. Children in the neighborhood who come to see Oscar and Blackie are often disappointed to find that both have buried themselves under the leaves Dr. Hech has placed in the bottom of the summer cage for their protection from summer heat.

Reports of snakes striking over a great distance are often grossly exaggerated. Dr. Hech has found that a snake is not usually over six to ten inches from the victim when he strikes. Another fallacy concerns telling age by the number of rattles. At one time Oscar had 22 rattles. Now he has only 15. The number of rattles depends on the number of times the snake sheds his skin. In a lean year, the snake may shed only once. In a good feeding year it may shed several times. Then too, snakes damage rattles and lose them, as Oscar did.

Dr. Hech acquired Oscar and Rudolph in a roundabout way. In 1952 he had a program on WSOC Radio, Charlotte, called "Carolina Outdoors." For one program he thought it would be interesting to demonstrate the sound of a live rattlesnake on the air. He called the *Charlotte Observer* to place a want ad for a rattlesnake. The girl taking the call refused to take him seriously and he had to go to the newspaper in person to place the ad. A reporter picked up the story, and then the wire service got on to it, the fact that someone was advertising for a rattlesnake. Replies came from all over the nation, but the only one that panned out was from the late Professor M. C. Yoder from Lenoir-Rhyne College. Professor Yoder had captured Oscar in 1958 and Rudolph in 1939. He made a gift of them to Dr. Hech.

While the radio program proved to be somewhat disappointing due to the inability of the microphone to pick up the true sound of the rattle, Oscar wasn't miffed at all. Dr. Hech with two rattlesnakes on his hands decided to keep them and see how long they would live. Rudolph has passed on but Oscar, as you can see, is still going strong.

Oscar and Blackie are not the only pets Dr. Hech owns; for he has a pet boa constrictor, too. But he's not poisonous, as are Oscar and Blackie, the erudite professor says; he crushes his victims!

The chances are that you won't ever have such a pet, but should you keep poisonous reptiles in captivity, be extremely cautious with them. Here, Oscar senses danger and heads for cover.

NATIONAL WILDLIFE FEDERATION

Wildlife's *Guardian Angel*

The Predator

by Bill Baab

Reprinted from Augusta Georgia Chronicle-Herald

ASK the average rabbit hunter what he thinks about hawks, owls, and foxes and he'll probably reply to the effect that "those varmits ought to be killed off."

Chances are, if the hunter's theory that the only good predator is a dead predator was carried out, he'd probably have few or no rabbits to hunt.

The cottontail rabbit and its cousins are probably the animals most hunted for food and sport in the United States. Estimates from various states indicate that hunters kill from one to four million annually.

One female rabbit can have one to three broods of up to six baby bunnies a year in the South, and although large numbers are killed by hunters each year, neither live trapping nor hunting has ever been know to exterminate the rabbit from any area.

There have been some areas in the southeastern part of the nation in which the rabbit population has "fluctuated." Some years, the number of rabbits has been great; in other times, there have been few cottontails.

Hunters, not really knowing the cause of the rise and decline of the rabbit, have pointed an accusing finger at the predator. Sportsmen and others have sought to make a "goat" out of the hawk, the fox, and the owl, among other wild creatures, who make a living by preying on others for food.

Mother Nature has given predators a place in her outdoor domain simply to keep other animals in her kingdom from being overpopulated. When predators such as the hawk and the owl are destroyed by the greatest predator of them all—man—then Nature's balance is upset and the door is left open for worse things to happen.

Like disease.

The Indian Beagle Club of York County, South Carolina, underwent an experience (see WILDLIFE, December, 1964) which, following an investigation by the Southeastern Cooperative Wildlife Disease Study, may have left rabbit hunters in that area a bit wiser in the planned ways of Nature.

The club converted about 30 acres of farmland into a field trial ground by enclosing it in a rabbit-proof fence. It was stocked with a number of rabbits and rigid predator control was practiced by club members. Very few foxes, hawks, or owls, ever acquired access to the rabbits penned within.

So far, so good, said the hunters. But shortly after the enclosure was built and predatory animals and birds were killed off, things began to happen to the rabbits.

Sporadic rabbit deaths occurred, but club members did not become alarmed until the second week of December, 1963, when 15 dead rabbits were found. Deaths continued and early in 1964, the South Carolina Wildlife Resources Department was notified. The conservation agency sent for Wildlife Disease Study biologists.

Through their investigation, a disease known as *Pasteurella tularensis* was identified. This is known to the layman as tularemia and to the hunter as "rabbit fever."

Wherever animals are kept in a manner that causes overcrowding, like within a beagle club's enclosure, potentialities of disease are accentuated. When natural predators like the hawk, the owl, or the fox, are not available to rid areas of sick and weak animals, then the possibility of an epidemic is strong indeed.

"Tularemia is a constant threat to beagle clubs everywhere," said Dr. Frank A. Hayes, director of the Wildlife Disease Study with headquarters at the University of Georgia School of Veterinary Medicine in Athens.

"Many rabbits are needed for the clubs' activities and with rigid predator control, the danger of the animals contracting the disease is great," he added. "What we would like to do is to someday find out from what source the rabbits are getting the disease."

In the meantime, Hayes and other officials of the Study are urging sportsmen in general and beagle enthusiasts in particular to reconsider and re-evaluate their theories and concepts regarding trapping and/or shooting hawks, owls, foxes, bobcats and other predators that may be living in the area.

"Predators could be called the 'guardian angels' of herd or flock," Hayes said. "One tribe of Eskimos in the Far North actually worship the wolf," he added. "They say that God made the reindeer and then He made the wolf to keep the reindeer healthy," Hayes explained.

The Indian Beagle Club isn't a unique case, by any means. Dr. Harold B. Hubbard, the veterinary school's epidemiologist, and Georgia's game biologists W. Wilson Baker and John M. Connell returned last week from Warren County, Virginia, where they were investigating a big bunny die-off on the 80-acre field trial grounds of the Apple Valley Beagle Club.

"They spent several days in the area trapping some of the smaller rodents in an effort to find out from where the rabbits had contracted the disease—definitely diagnosed as tularemia," said Hayes.

"They reported that rabbit carcasses in the hundreds were scattered around the enclosure," he added. "Predator control was

• **continued on page 26**

NORTH CAROLINA WILDLIFE

RESOURCE-O-GRAM

A ROUNDUP OF THE LATEST WILDLIFE NEWS

"Protect Natural Beauty" is Theme of National Wildlife Week

This year's National Wildlife Week scheduled for March 20-26 will have more than usual national emphasis in view of the Whitehouse interest in keeping our country beautiful and eliminating eyesores in the natural scene caused by carelessness, neglect, and exploitation of natural resources.

The "week" was initiated by President Franklin D. Roosevelt in 1938 and has been an important national event ever since. People of North Carolina, whose state is known throughout the world for its natural beauty, are urged to follow the precepts of the theme "Protect Natural Beauty" throughout the year, with special emphasis during the week of March 20-26. Wildlife clubs, garden clubs and other civic groups have planned special programs emphasizing the preservation and restoration of natural beauty.

Boat Registered? Fishing License Handy?

The Wildlife Resources Commission, recognizing that fishing and boating weather are near at hand, reminds Tarheel outdoorsmen that boats powered by machinery of more than 10 horsepower must be duly registered and numbered before they may be operated legally on the public waters of the state. 1965 fishing licenses expired last December 31, and 1966 fishing licenses are now required. Combination hunting-fishing licenses (for the 1965-1966 season) are valid until next July 31.

Hunting Season Ended

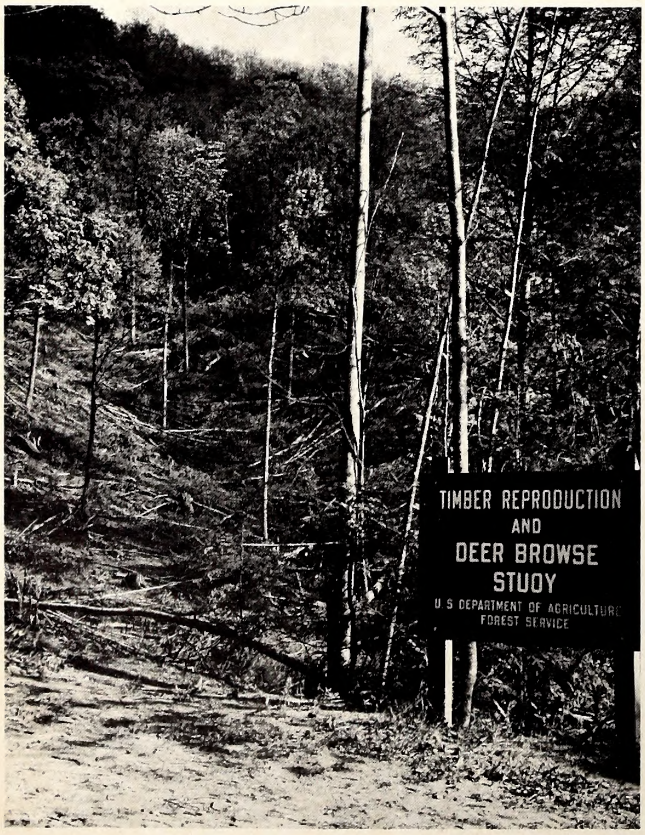
General hunting seasons ended with the closing of season on raccoon and opossum on March 1. Remaining hunting will be on commercial shooting preserves, and for such non-protected species as crows and woodchucks. In a few instances local laws permit fox hunting.

Deadline for Wildlife Plantings

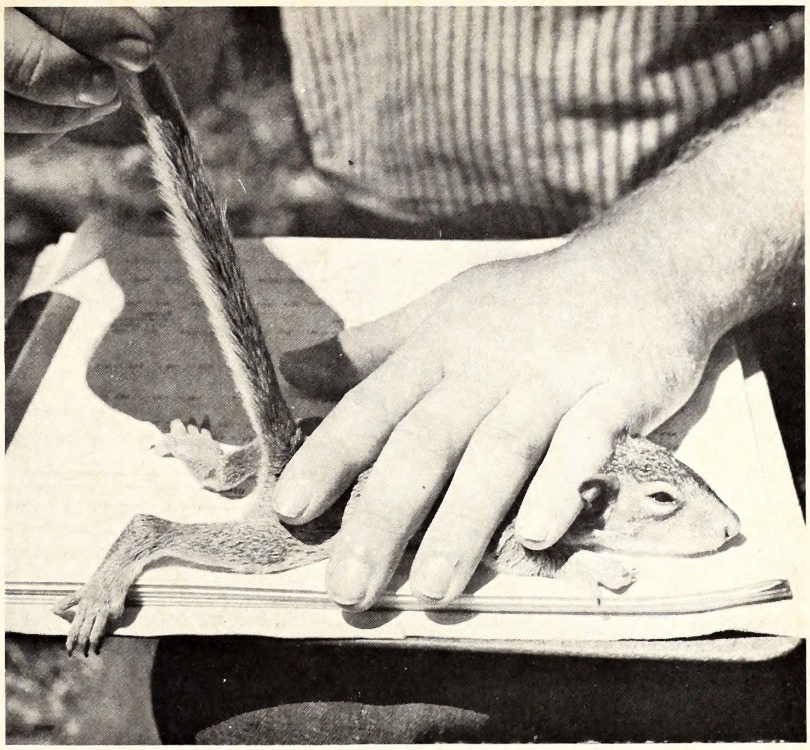
The Wildlife Resources Commission has on hand an adequate supply of lespedeza and other farm game habitat planting materials, but if these are to be used this spring, persons wanting them must make immediate application to the Commission. There is no charge for these materials.

RES

Fishery Biologist Don Baker and his helper, Larry Davis, weigh and measure white bass from a Fontana net. The fish were on their spawning run. Below left, an interagency study is conducted on deer foods. It will help manage deer.



The game biologist's ears and eyes become the tools of research in white whistle count in the early morning. Below, rainbow trout are observed to detect dietary abnormalities. Healthier fish will be t

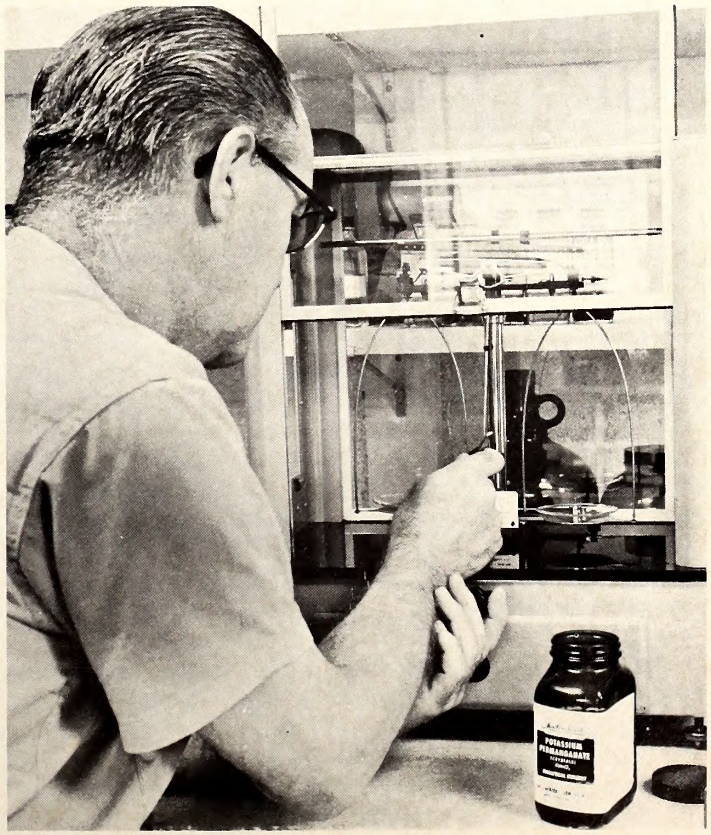


Body length of a nestling gray squirrel is measured and recorded. Left, a leg band is applied to a trapped mourning dove to determine its travels.

EARCH

Staff Photos

Research takes many forms. Pictured here are but a few of the Wildlife Commission's activities designed to find out the answers to better hunting and fishing. Much of the research is expensive and time consuming, some ending in negative or impractical answers. But most of the carefully planned projects yield information upon which can be based sound management of our wildlife resources.



Water quality is important to fish management. Right, chemicals are carefully weighed in a fish disease study.

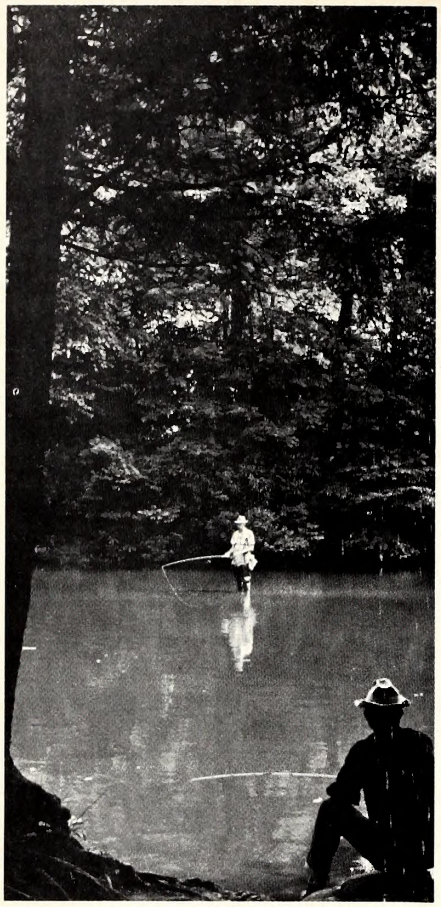


TABLE 4-A
Average "Mileage From Home" Reported By Anglers By Districts

District		Licensed Residents	Non-Residents	Unlicensed Residents	All Anglers Combined
1		65	85	6	53
2		39	NSD*	7	26
3		16	NSD	7	13
4		26	NSD	7	14
5		18	NSD	7	13
6		26	NSD	10	20
7	Designated Trout Water only	39	NSD	6	34
	Excluding Designated Trout water	12	NSD	8	12
8	Designated Trout Water only	21	83	16	22
	Excluding Designated Trout water	25	NSD	7	24
9	Designated Trout Water only	29	99	7	27
	Excluding Designated Trout water	24	54	7	21
Statewide		30	98	7	24

*NSD—Not sufficient data for meaningful estimate

Creel Census - 4

How Far Do Fishermen Go?

by Dr. F. F. Fish
Asst. Chief, Div. of Inland Fisheries

HOW far will fishermen go? This really sounds like a loaded question, but for present purposes the issue will be confined to estimates of the average distance the North Carolina angler travels to fish based upon the information reported to the North Carolina protectors during their fishermen contacts in the 1964 Statewide Creel Census. Actually, to minimize the work involved, this information was requested from every tenth angler contacted, for it was anticipated that within any given area the travel pattern would be fairly consistent so an enormous mass of data would not be required to indicate trends.

The question put to the angler during every tenth contact was, in essence, "How far are you from home right now?" This means that the distance reported to the protector was but one-half the miles actually traveled for it can be reasonably assumed that the angler sooner or later ended up at home again.

The average values calculated from the "mileages from home" reported by some 3,000 anglers has been summarized in Table 4-A.

Reviewing these data, it would seem that the waters of District 1 definitely lured resident anglers from a greater distance than did the waters of any other District. Presumably, the unique attraction there would be the estuaries where the ranges of salt- and fresh-water fish species overlap and fishing generally is excellent. The second category of attraction, although of somewhat lesser magnitude, is the 30- to 40-mile average lure of both District 2 waters and the trout waters of District 7.

The distances from home reported by the unlicensed anglers average slightly over seven miles in the case of every District—a statistic that seems surprising from two aspects. First, it is amazingly uniform throughout every District of the State. Secondly, the magnitude of this statistic does not fit very conveniently into the image of the unlicensed cane-pole county resident doing practically all of his fishing in the creek "behind the shack." It would seem that a 14-mile average round trip by the unlicensed anglers would involve some dependence upon vehicular transportation.

Unfortunately, the total annual travel mileage associated with fishing the inland waters of North Carolina cannot be determined with available data. This must total an enormous sum, however, as can be illustrated by the following calculations that

TABLE 4-B
Average Immediate Cash Outlay Reported By Anglers By Districts

District		Licensed Residents	Non-Residents	Unlicensed Residents	All Anglers Combined
1		$8.94	$11.94	$1.32	$7.44
2		5.04	NSD	1.03	3.38
3		2.37	NSD	0.67	1.50
4		3.40	NSD	1.15	1.96
5		3.84	NSD	1.64	2.88
6		3.44	NSD	1.25	2.67
7	Designated Trout Water only	6.78	NSD	0.27	6.37
	Excluding Designated Trout Water	3.93	NSD	1.75	3.30
8	Designated Trout Water only	3.75	NSD	0.74	2.98
	Excluding Designated Trout water	4.30	NSD	1.57	3.69
9	Designated Trout Water only	3.89	6.50	0.73	3.24
	Excluding Designated Trout water	4.06	NSD	1.23	3.44
Statewide		4.59	NSD	1.15	3.49

*NSD—Not sufficient data for meaningful estimate

are based solely upon *the single trip* during which the angler was contacted in the Statewide Creel Census:

(a) The licensed resident fishermen contacted, averaged 60 miles of travel for their trips and there were 365,557 licensed resident fishermen that year; so if each angler made but one trip per year of the average distance, the mileage involved would total: 21,933,420.

(b) On the same basis, the nonresident anglers contacted averaged 196 miles of travel per trip; so one trip per year for each of the 39,321 nonresident anglers would total: 7,706,916.

(c) The unlicensed fishermen contacted averaged 14 miles of travel per trip; so if each of the estimated 357,143 unlicensed fishermen made but one trip per year, their mileage would total: 5,000,002.

The grand total of mileages traveled annually to fish the inland waters, based upon the obviously understated assumption that each fishermen in North Carolina makes but one fishing trip per year: 34,640,338.

This total has been calculated only as an example of what the annual traveled mileage associated with inland water fishing would total, if during the year, each angler made only the one trip on which he was contacted. It does offer a springboard, however, should anyone wish to make a flying guess at the total mileage traveled by all anglers during the course of a year. All one needs to do is multiply the above grand total by the average number of fishing trips made in a year by the average angler. This assumes, of course, that you happen to have some statistics at hand that unfortunately I do not have.

While each tenth angler was pinned down with a question about his distance from home at the time of contact, a second question was asked which, in essence, was stated, "How much more cash do you think you would have in your pocket totoday but had say—stayed in bed or engaged in some comparable pursuit which involved no outlay of cash?" Lest some misunderstanding arise right at the outset, this cost inquiry was never intended as a foundation for estimating the total economics of sport fishing in North Carolina. Such estimates involve all sorts of subtleties not to be derived from the guess of a streamside interview. The economics of fishing must include such finer computations as an amortization on a per-trip basis of the not-inconsiderable investment most anglers have sunk in fishing gear and equipment, the depreciation permissable on that lure that hung up on an underwater stump and was never recovered, and perhaps part of the cost of that permanent your wife would not have gotten had you not gone fishing!

The cost question posed during the statewide creel census was intended to develop only the direct, immediate - out - of - pocket, cash expenditure of the day for such items as the dozen minnows bought for bait plus a can of beer, Vienna sausages, and the box of fig newtons picked up for lunch at the cross roads store. Obviously the immediate cash outlays would lead to a very modest sum but it is a sum that is minimized usually when dealing with the over-all economics of sport fishing and overlooked entirely and deliberately in any household estimates of the comparative costs of one's hobby versus his wife's millinery.

These data, summarized in Table 4-B do lead to very modest sums. Projected on the same basis as were the travel data, the licensed resident fishermen, in aggregate, spent $1,677,907; the nonresident fishermen $386,132; and the unlicensed resident $410,714—all adding up to a total of $2,474,753. Again this estimate of the normally overlooked immediate out-of-pocket expenditures has been predicated upon the patently erroneous assumption that all anglers make but one fishing

• **continued on page 27**

Using Community Resources in the Classroom

by Joyce Street Masters
7th Grade Teacher
Tipton Hill School

SOIL CONSERVATION SERVICE

Larry Curle discusses soil conservation with the 7th graders from Tipton Hill School. Such areas are close to most schools.

ON Thursday, May 13, 1965, the seventh grade classes of Bowman, Buladean, and Tipton Hill took their sixth annual all day field trip. This trip is usually the culminating activity of a conservation unit.

Mr. Ray Bryant, Soil Conservationist of Mitchell County works closely with the teachers during the teaching of the conservation unit and he plans the field trips as much as a year in advance.

Before the students leave the school, they are numbered 1,2, 3, or 4. This places them in a certain group since we have four big areas of study. These areas are wildlife, soil, forestry, and good conservation practices in farming. We take tours in each of these areas which last one hour.

To keep the groups together, stakes are driven into the ground and each group goes to the stake bearing its number; they return to this spot when the tour is over. The leaders of the tours rotate and thus are afforded the opportunity of visiting each area.

The wildlife leaders this year were Scott Beasley, Wildlife Protector, Spruce Pine; John Collins, Wildlife Biologist, Wildlife Commission, Morganton; and Ray Smith, Wildlife Biologist, Soil Conservation Service, Raleigh. The importance of wildlife in the balance of nature, habitat, the need for wildlife cover, telling the age of animals, game laws, and other phases of wildlife were thoroughly discussed by the specialists in each field.

In the soil discussion, Ed Brewer, Soil Scientist, Soil Conservation Service, North Wilkesboro, and Jack King, Soil Scientist, Soil Conservation Service, Waynesville, were the leaders. Top soil, subsoil, and parent material were covered. Why soils are of different colors and textures was very interesting. These leaders also stressed the need for conservation of our soil since the per capita acreage is decreasing in the United States each year. Soil samples were dug and the layers of soil could be plainly seen by the boys and girls. A great percentage of these students will live with the soil the rest of their lives, and all will be dependent on it in some way. This tour was practical as well as interesting and provided a vivid way to see the subject first hand.

David Burnette, Assistant County Agent, Bakersville; Billy Jones, Engineer, Soil Conservation Service, North Wilkesboro, and R. C. Wyatt, Soil Conservation Service, Newland, were the leaders for the tour on conservation practices in farming. We were very fortunate in being in the Pleasant Grove Community since the practices we were looking for were in evidence. In one field we could see strip cropping, contour plowing, crop rotation and cover crops. We could also contrast land that had been given nitrogen with land that had none. Mr. Jones showed the boys how to make a contour furrow by using a surveyor's level and rod. Here again the practicality of these conservation measures to farm boys cannot be overemphasized.

In forestry we had two leaders who had not been with us before, Darrell F. Roberts, Forest Service, Burnsville and J. C. Jones, Forestry Extension Specialist of Raleigh. These leaders did an outstanding job by showing the uses of trees and especially the value of trees in the economy of North Carolina. They also pointed out to the boys and girls the fact that we live in a good timber belt. We live in an area where we may also see a great variety of trees due to the range in elevation. The lowest point in Mitchell County is 1700 feet above sea level and the highest point is over 6500 feet. This point is on Roan Mountain where we find balsam fir growing. Methods of tree identification were taught and a way of determining the age of a tree was demonstrated.

In my own classroom at Tipton Hill we are convinced that conservation is everybody's business and that every activity in life depends on wise use of our natural resources. Every subject in the seventh grade was correlated with our study of conservation. I think one of the best things my class did was to compose this poem:

GRATITUDE

Oh Giver of every good gift we thank thee for:
The soil: our lives depend on it.
The cooling water: it quenches our thirst.
The birds that sing: They gladden our hearts.
The flowers that bloom: they brighten our weary eyes.
The sturdy oak: it gives us welcome shade.
Our friends: they make us happy within.
And other things. Amen.

Which is Which?

by Art Dickson

STRIPED bass, white bass, white perch . . . which is which? Although these are three distinct, separate species of fish—biologically as different as largemouth bass are from trout—much confusion arises from their look-alike appearance. Basically they are all silvery in color and have the same general body shape. To add to the confusion, they may be found in the same lake or river.

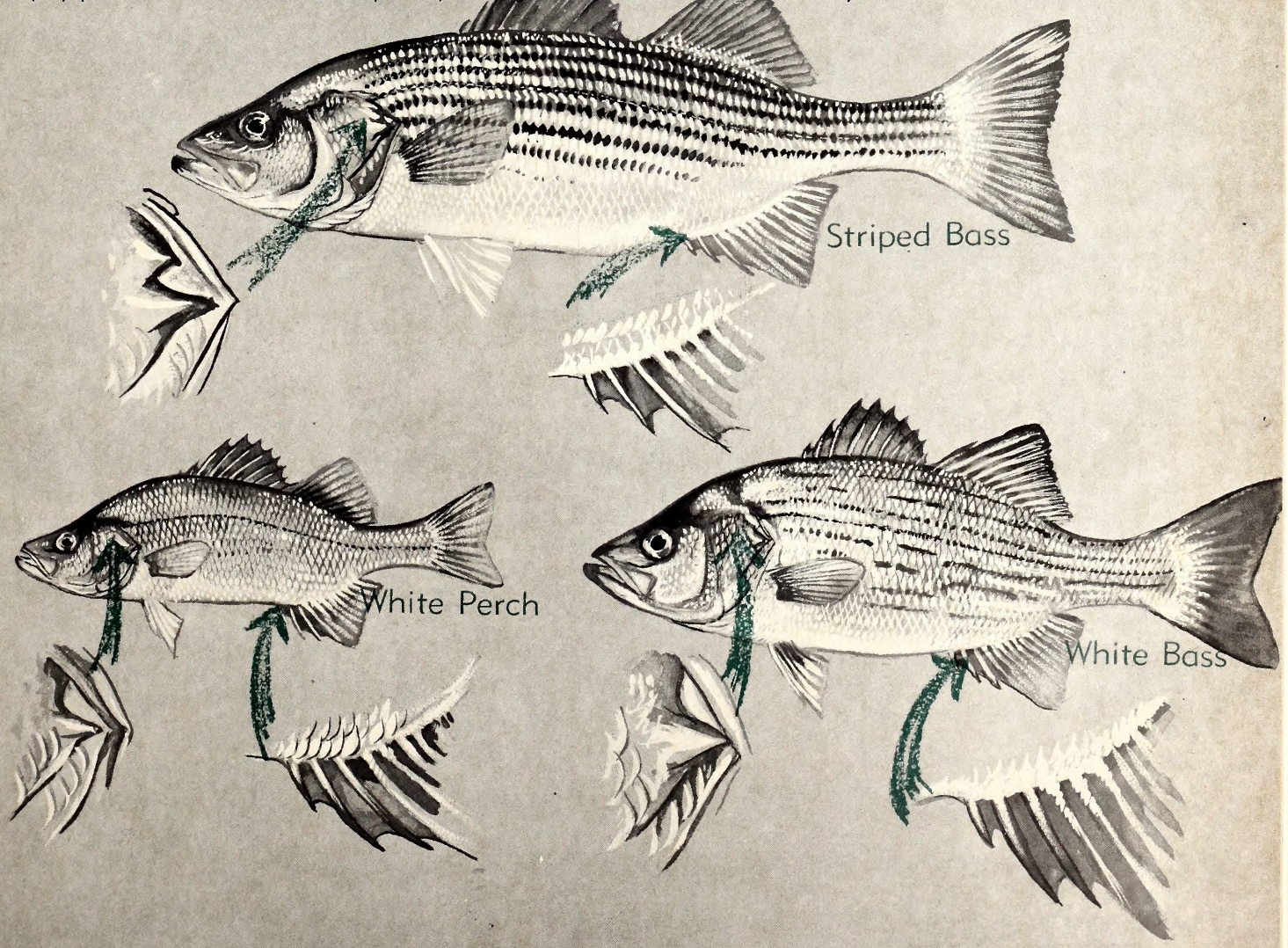
How can the angler be certain which species he has caught? Unfortunately, there is no one outstanding characteristic with which we can separate the three. By using a simple combination of characters, however, it is an easy matter to distinguish them.

First of all, let's check the dorsal fin: if it is continuous, that is, if the spiny portion is attached to the soft portion, forming one fin, you can say it is not a striped bass or a white bass. Thus you have at least identified the white perch.

Now if our fish has the dorsal fins separate, we must look for some characteristic which will distinguish the white bass from the striped bass. One of the easiest things to look for is the "spines" on the opercular flap or cheek of the fish:

A striped bass has two distinct spines which project outwards, while the white bass displays only one spine.

Thus a quick look at the dorsal fin and the operculum helps the angler separate these three members of the true bass family. Of course, there are other features which can be used to differentiate them, but the dorsal fin and operculum seem to be the best and most easily seen.



Let's Grow 'em Walnuts

by Howard J. Doyle
Council Forester
Hardwood Research Council
Statesville, N. C.

The following article points up an opportunity for sportsmen to help wildlife and at the same time stem the drain of a highly valuable timber resource.

U. S. FOREST SERVICE

Walnut seedlings or nuts make rapid growth when planted on fertile soil, especially when cultivated and fertilized. These three-year old seedlings averaged more than six feet tall. Note 27-foot space.

SOMEBODY has said, "When things are bad nothing is done about them. But when things get very bad, something will be done!" We have reached the "very bad" state with our hardwoods in general and our walnuts in particular.

Latest survey figures show that less than ten percent of the hardwood trees most generally used by industry are in diameters of 15 inches or greater. Some of the ten percent are in large culls and are of no practical use to industry.

With walnut in such high demand both at home and abroad, the supply of high-grade material is fast reaching the "hen's teeth" stage. Average prices for walnut logs run from $100 to $200 per thousand board feet (Doyle scale) for sawlogs, and $350 to $400 for veneer logs. The domestic use of walnut for veneer has doubled in the past ten years. To complicate matters even further, considerable quantities of walnut are being exported. Since even the demand for domestic use is in excess of annual production, it's high time something is done if we are to meet the demands of the future.

In North Carolina walnut usually occurs naturally as scattered trees within existing hardwood timber stands. To increase growth of such trees they should be released from competition and pruned to improve their quality.

But to really lick the shortage, planting must be made with the same intensive practices as are used for agricultural crops. For best results fertile lands should be used and sites prepared as for planting corn. Only large seedlings (at least one-quarter inch in diameter at the ground line) should be planted, or carefully selected nuts. Fertilization at time of planting should be at the same rate as needed to produce corn at the rate of 100 bushels per acre and grasses and weeds around the young trees should be controlled by cultivation for at least the first few years.

Researchers with the Central States Forest Experiment Station have found that height growth may reach two to four feet per year with clean cultivation and the application of fertilizers. They are now planning studies in irrigating walnut plantations to further increase the growth rate. Through these intensive practices, they hope to double, or perhaps treble, the growth as compared to the average wilding. Some of the better plantations in the midwest have grown 12 to 13 inches in diameter in 35 years. With the same intensive practices and our longer growing seasons, we in North Carolina might hope to equal or even exceed this rate. Best growth will be made on deep, alluvial well-drained soils of the Piedmont and mountain coves.

Soybeans, or other plants for wildlife, may be grown between trees in a plantation for the first

• **continued on page 27**

Black walnut can be planted in combination with agricultural crops such as soybeans. Crops provide income as well as wildlife food.

U. S. FOREST SERVICE

Conducted by John Parker

LOCAL Notice to Mariners is a publication of the U. S. Coast Guard. In this area it is issued weekly by the Commander, Fifth Coast Guard District, Federal Building, 431 Crawford Street, Portsmouth, Virginia 23705. As the title implies, this publication deals especially with aids to navigation, hazards to navigation, safety afloat, etc. If you feel you could put to good use this publication, you can have your name placed on the mailing list by writing to the above address.

Not all of the information in the Notice can be considered of general interest; but from time to time we will pass along the information which fits that category.

For example, the Coast Guard has been in the process, since late 1962, of equipping lighted buoys with a sun relay. This mechanism controls the light on the buoy by turning it off during day-light hours and turning it on during hours of darkness.

Buoys presently equipped with a sun relay are also equipped with an identifying mark consisting of a white circle two inches in diameter, centered on a four-inch by ¾-inch white bar to distinguish them from lighted buoys not presently equipped with a relay.

This identifying mark will appear to the right and above the number or letter.

Mariners observing buoys extinguished during daylight hours are requested to check for this identifying symbol, before reporting the aid extinguished.

The Coast Guard continues to improve the various aids as evidenced by the above information. Navigational aids serve all boaters and their considerable cost is shared by taxpayers. Regardless, the "buoy vandal" is still around and there have been increasing reports of vandalism to aids to navigation in the Fifth Coast District. Witnesses to vandalism to aids to navigation are requested to report the incident to the nearest Coast Guard unit. The law is cited below for the benefit of marine interests.

Title 14 U. S. Code Section 84

"It shall be unlawful for any person . . . to remove, change the location of, willfully damage, make fast to, or interfere with any aid to navigation. . . . Whoever violates the provisions of this section . . . shall be fined not more than $500 for each offense. Each day . . . shall be considered as a new offense."

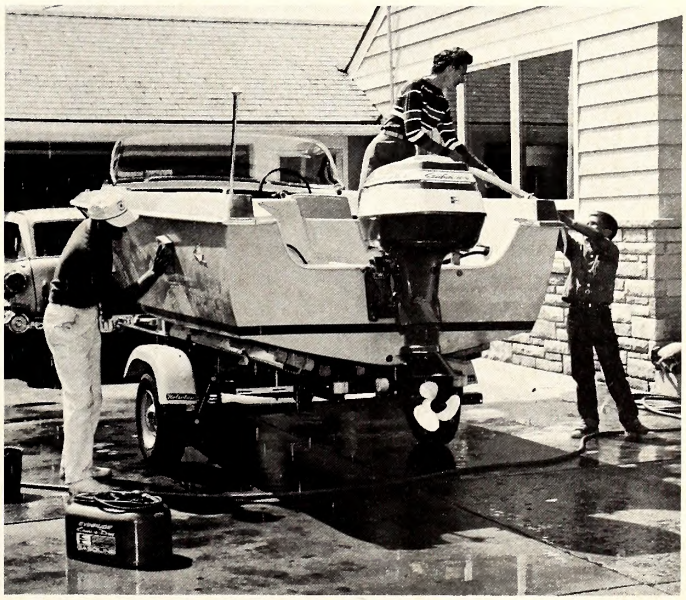
Not only is it illegal to make fast to an aid to navigation, it is just plain hazardous.

Boating Booklet

Most of North Carolina's pleasure boats are still under canvas, dry storage, or carports. At least, we hope that your idle rig is being protected against the elements. The boating season is just around the corner, but there is still time for the old pro to brush up on some of the finer points of boating and for the newcomer to digest some of the basics. The Red Cross has a new booklet entitled, "Basic Outboard Boating." The price is 50 cents. Earlier publications entitled, "Basic Canoeing" and "Basic Rowing" are still available for 35 cents each. Inquire at a local Red Cross office or write to the American National Red Cross, Southeastern Area, 1955 Monroe Drive, N. E., Atlanta, Georgia 30324 for your postpaid copies.

Maintenance Tip

Trailer-size boats, powered and non-powered, inboard or outboard are found on trailers most of the time. And while at rest on a trailer bed, a boat can



EVINRUDE MOTORS

Damage to a boat's hull by improper trailering may sneak up on you. Check supports for adequate suspension and don't forget the tie-downs. Spring maintenance is at hand too.

sustain damage if the boat is not matched to the trailer. Improper support may cause the hull of a wooden boat to sag or bow upward. Boats constructed of fiberglass or wood may sustain severe wear, even to the extent that a hole is worn in the hull, if supports are improper or insufficient in number. Check your boat hull now. If there is any sign of the wear mentioned, take action to adjust, replace, or add rollers and bunks. In some cases, special padding may be needed.

A Matter of Choice

by Luther Partin

Photos by the Author

WILDLIFE is a product of the land and we often make the remark, with ample justification, that wildlife is a crop. But wildlife does not monopolize the land on which it is produced, like an ordinary crop. Consequently, we may be only partially aware of the total wildlife populations around us as we manage the land to produce food and fiber.

Research by our own Wildlife Resources Commission and other governmental and private conservation agencies over a relatively brief period of time has furnished us with considerable knowledge regarding wildlife management. Before this knowledge was acquired, about all the management applied was an inventory of the harvest—whether it was good or poor, was attributed to the weather, the moon, or some other convenient scapegoat.

Now the land manager is in possession of, or at least has access to, sufficient information to enable him to initiate casual actions and make a reasonable estimate of the effects on wildlife. He can use this information to produce wildlife or as a diagnostic tool to determine why he doesn't have as much hunting and fishing as he once did. It is strictly a matter of personal choice.

The decisions we reach and the actions we take have a direct bearing on a natural resource whose destruction is not as obvious as a gully or a dead tree. Quite often it's the procedure that hurts, rather than the policy. To call back a song title of a few years ago, "It Ain't What You Do, It's How What You Do It."

It is often said that any good soil and water management practice is good for wildlife. While this is generally true, another classic song title from a past generation reminds us, "It Ain't Necessarily So." A grass waterway or meadowstrip may attract quail for nesting. But regular mowing may nullify each nesting effort by the quail, resulting in zero production. If the birds had utilized less attractive habitat, a second or third re-nesting might have been successful. Here the procedure is the villain—the policy is good.

The Wildlife Commission's habitat planting materials represent a simple and effective way to increase small game populations. They should be a part of any farm plan, particularly the perennials that do their job year after year without replanting. To be most effective, however, the planting site should be selected with regard to water, soil fertility and natural cover. Wildlife cannot be relegated to "odd areas" simply because nothing else can exist there.

There are many land management practices that can be planned to directly benefit wildlife. An interesting use has been made recently of the "skip row" left unplanted by many tobacco farmers. They do this to permit tractor access into the field after the crop is too tall for straddling the rows.

Browntop millet is planted in this row about the time the tobacco is "laid by" (last cultivation). Equipment passage down the row does not normally harm the millet. It usually matures about the time the tobacco stalks are cut, with the seeds falling out on the ground. This makes an excellent attraction for doves—open ground with plenty of seeds available without having to work for them.

The cost for seed and fertilizer runs from $6-$8 per acre of millet planted. A nominal charge for hunting easily makes it a profitable practice.

The farmer is a businessman. He naturally leans toward conservation measures that cut costs or increase profits, or better still, both. Recent experiments in minimum tillage indicate corn may be grown successfully in sod or stubble without plowing. This is especially good news for dairymen. They can plant corn in a grass pasture, produce a good crop of silage, and put cows back on the grass at a time when they really need the grazing.

Of course, there's more to it than simply planting and harvesting. Special planting rigs must be used along with herbicides to keep down the grass growth while the corn is growing. But in addition to lowering the cost of crop production, the grassy ground cover provides nesting sites for small game. Nesting cover is usually a scarce commodity on a dairy farm, since the available land is usually grazed or cultivated.

Stubble planting also preserves nesting cover during the time of critical needs. Small grain is extensively used by small game for nesting. Harvest operations may break up some nests, but if the stubble is not turned under, a considerable amount of cover is still available and small game can continue to nest and feed. By planting a forage crop in the

If cover for upland game is your problem, consider the use of tall fescue. It serves quail and rabbits well for resting and nesting.

stubble without plowing or disking, nesting habitat can be preserved with lower operating costs for the operator.

Minimum tillage is attractive to the landowner because he can quickly see a dollar and cents value. There are other benefits, such as reduced loss of topsoil, better water percolation and increased wildlife cover, that also have a money value, but are not immediately obvious.

If wildlife is to be regarded as a crop, we must expend a little effort before the harvest can be made. As in the case of the millet planted to feed a game species, sometimes we have to do things specifically for wildlife.

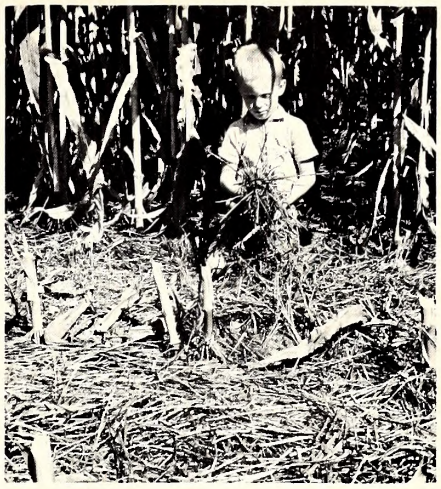
Recommendations for managing pine forests usually include the removal of hardwoods. But in the interest of wildlife, it is a good idea to leave several good-sized nut bearing trees per acre of woods. Many animals and birds rely heavily on the mast of hardwood trees for winter survival. A pure stand of pines is regarded by many biologists as a wildlife "desert."

Interest is growing over the prospects of developing "duck-fields." These are fields that can be planted to a choice duck food such as corn or milo, then flooded one-two feet deep in the fall to attract ducks. Bottomland fields work best as they are low and flat, but higher locations can be used if the topography is suited and water is available. The grain crop can be harvested before flooding, leaving the waste for waterfowl. Some expense is involved, but ACP financial assistance is available (check in your county) and a charge for hunting waterfowl will help recover the remainder of the capital investment.

There are many areas in which the activities of the landowner have a direct influence on wildlife. If he permits *all* benefits to wildlife to be incidental, he will only have incidental populations. But if he wants wildlife as a permanent resident in sufficient numbers for sporting and esthetic enjoyment, then consideration for wildlife must be a part of his long range plans.

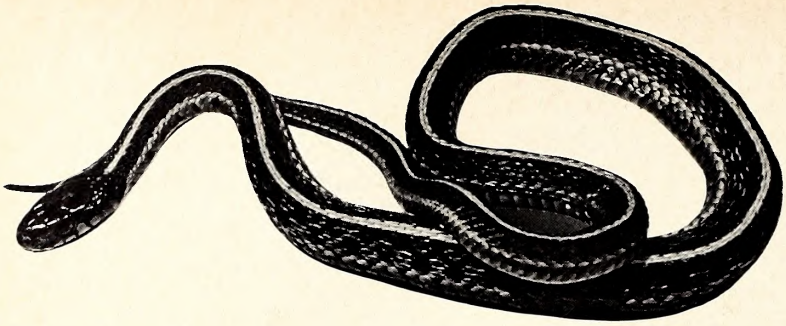
NAPIER PARTIN

This is often called sod planting—growing cover and food for wildlife while also growing an agricultural crop.

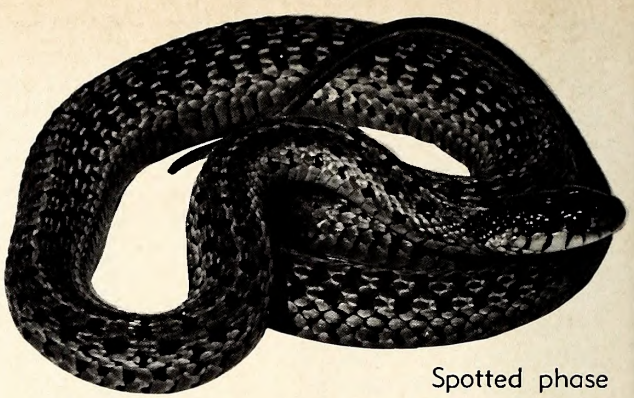


Here, corn has been planted in oat stubble without plowing. It provides erosion control as well as cover.

This view of sod planting after the corn stalks have been cut shows the fine hiding cover left. The dove field below has millet planted in the "skip row". The result is dove food and an agricultural crop at little extra expense.



Striped phase



Spotted phase

Eastern Garter Snake

Photos by

Joel Arrington

by Franklin F. Snelson, Jr.
and William Palmer

Cornell University and N. C.
State Museum of Natural History

ONE of the most common and widely distributed of all North Carolina snakes is the eastern garter snake, *Thamnophis sirtalis sirtalis.* Despite its abundance in most sections of the state, many people experience difficulty in identifying specimens. Certainly few snakes exhibit such bewildering arrays of coloration and pattern as this species. The general coloration is typically some shade of olive, greenish, or brown with three longitudinal yellowish stripes, those along the sides occupying the 2nd. and 3rd. scale rows (counting up from the belly plates). In some individuals, however, the stripes may be virtually replaced by irregular dark spotting. Many specimens from the Coastal Plain, especially from the southeastern portion, may be reddish with dark spots. The underside is usually pale green or blue-green with two rows of obscure black spots, one row on each side of the belly. The maximum recorded length for this subspecies is four feet, but examples exceeding a yard are not common in North Carolina.

This ubiquitous species, composed of several variable geographic races, occurs throughout most of the United States and ranges far to the north into Ontario, Quebec, and into the Yukon Territory of Canada. The North Carolina distribution encompasses the entire state, from the tidewater flatwoods to the very highest elevations in the mountains.

The garter snake seldom is found far from moist areas. Preferred habitats include damp meadows, pastures, flatwoods, hardwood ravines, along streams and lakes, seepage areas on mountain sides, and a wide variety of other damp situations. It is as often encountered abroad as hiding beneath stones, logs, and similar cover. Specimens often are abundant about the borders of small streams in suburban sections of our largest cities.

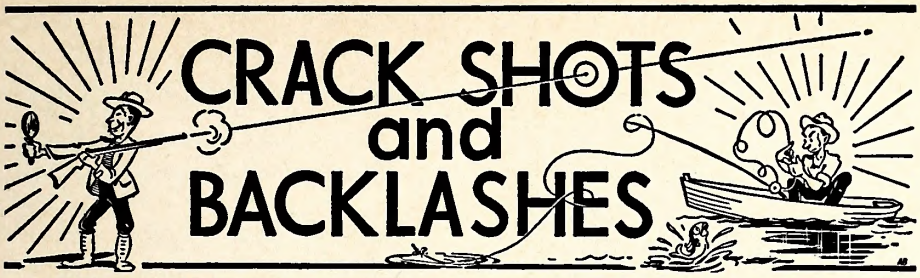
When first collected many examples defend themselves by biting and the teeth of larger individuals are capable of breaking the skin. The resulting discomfort is, however, no greater than that felt after being scratched by a thorn. When molested, garter snakes flatten their bodies, thrash about wildly, and extrude a foul-smelling musk. This secretion probably is a more effective defense mechanism than is the weak bite.

The food of this species consists primarily of earthworms, insects, small fish, frogs, toads, and salamanders. Although there are reliable reports of this serpent feeding upon small birds and mammals, these instances probably represent the exception rather than the rule. Many specimens in captivity at the State Museum were offered birds and small mammals but none could be induced to accept such creatures as food.

The eastern garter snake is one of our most prolific species. After mating, usually in the spring, a single female may give birth in the late summer or early fall to 50 or more living young. These juveniles are similar in appearance to the adults and at birth measure 6 to 8 inches in length. In relation to body size the head appears proportionally larger in young snakes than in adults.

Most specimens thrive and feed regularly in captivity. Like most snakes, even many of those species preferring moist or aquatic habitats in nature, garter snakes fare better when housed in clean, dry cages, provided only with a small container of drinking water and shelter under which to hide.

Because of its abundance and prolific breeding the garter snake is one of the most common species for laboratory researches in reptilian physiology and embryology. In addition, it is of great importance in various nature centers, camps, and classroom exhibits where the animal is constructively used to aquaint the children of today with the snake as it actually is and not as many superstitious and credulous persons would have them believe.



DEPARTMENT OF LETTERS TO THE EDITORS, FIELD NOTES, AND ITEMS OF INTEREST

Conducted By Rod Amundson

AMERICA THE UGLY

Oh pitiful for smoggy skies
For jungles made of stone.
For blazing mountain tragedies,
Where bubbling brooks did roam.
America! America!
We shed our trash on thee,
And now regret the mess we made,
From sea to shining sea.

* * *

How terrible the picnic trash,
The beer cans by the road.
The sewage pipes that feed the streams,
Their deadly, smelly load.
America! America!
With lakes of glistening foam
And airplanes spraying poisons on,
The dear land we call home.

Brent Renfrow

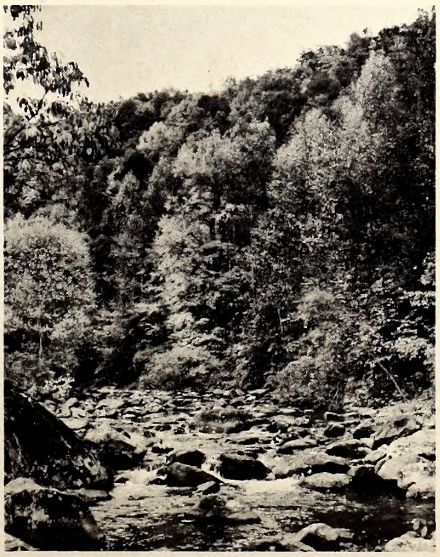
"In the beginning God created the heaven and the earth." The book of Genesis goes on to record that creation took six days. The earth was well planned, but ever since creation, people have been digging in it, moving it to different locations, plowing it, bombing it, draining it, scarring it with highways and strip mines and causing much of it to erode into the ever-beautiful sea. Sylvan beauty has been converted to blackened wasteland. Once clear streams run red with life blood of the land and stink with the stench of pollution.

This year for the 28th time our state and our nation will observe National Wildlife Week, with this year's slogan: "Protect Natural Beauty." President Lyndon B. Johnson and Governor Dan K. Moore have set aside the week of March 20-26 for special emhasis on keeping our countryside beautiful and enhancing its beauty.

Last fall when the week-sponsoring National Wildlife Federation was planning protection of natural beauty as the theme for this year's observance, Governor Dan Moore wrote letters to the heads of various state agencies asking for concrete suggestions on how the natural beauty of North Carolina can be protected and enhanced. The response to these letters has been gratifying.

Among the suggestions made to the Governor were for stringent laws to prohibit littering of boating and fishing access areas and other public outdoor recreation facilities; clearer, enforceable statewide law to prohibit putting brush and slash from timber cutting operations into public streams, and beautifying secondary road rights-of-way by planting grass that would reduce erosion, pollution, and road maintenance costs.

North Carolina is still a beautiful state despite automobile graveyards and many other unsightly, man-made eyesores. Tarheels are proud of their state. Let us hope that this pride is not the pride that ". . . goeth before a fall." We cannot restore our natural beauty to its precolumbian pristine condition; but we can correct many of our past mistakes and refrain from making more in the future. Our lives will be richer if we do.



Complimentary Closing

Some of the most sincere compliments that come to Wildlife Commission personnel come from youngsters whom the Commission strives to serve. This letter to Lunette Barber, Wildlife Education Representative is typical.

Dear Miss Barber:

I want to thank you for coming and sharing your time with us. I think that everyone enjoyed your talk very much. West End School needed someone like you to come and talk about the topic you did, wildlife. Your talk was very interesting and true! My whole family is fond of wildlife. In winter we put out food for the birds and squirrels. We also take the wonderful WILDLIFE magazine. I think that it is one of the very best magazines any parent can take for their children.

Please come and talk to us again.

Parkie Gilliam
Fourth Grade, West End School

Land Snakes!

DEAR SIRS: I would like to reassure Mr. C. W. Richards of Freeport, Illinois, that Hendersonville and surrounding area is not snake-infested.

I have hunted and fished this area for 20 years and have never encountered more than two or three poisonous snakes. I have fished the lakes and streams, some of them quite remote. If a person goes snake hunting, he can probably find a few; I don't say we don't have some, but I have never heard of a death in this area from snake bite.

Something I consider a lot more dangerous is the group that is promoting nothing but artificial lures with one hook in all our streams. They have succeeded in getting practically all Refuge streams designated Native Trout Waters, which excludes all bait fishermen from these waters.

I should think there is plenty of room for both, with all of our beautiful streams.

I would like to extend a warm invitation to Mr. Richards and all other retirees to make their home in some of the most beautiful non-snake infested country in the world. Please call on me for directions when you arrive; my phone is 692-3518. F. R. DORSEY, FLAT ROCK

P. S. I am not with the Chamber of Commerce.

KNOW YOUR PROTECTOR

Joseph J. Jefferies

Joseph J. Jefferies, Cherokee County Wildlife Protector, was born on April 9, 1931 in Danville, Virginia. He is the son of Mr. and Mrs. J. J. Jefferies of Moore County, North Carolina. Mr. Jefferies served four years in the Navy. Prior to employment with the Wildlife Resources Commission, Jefferies was a barber in Charlotte and Raleigh, North Carolina.

Jefferies completed the Pre-service Training School for Wildlife Protectors at the Institute of Government in Chapel Hill in 1962. On August 1, 1962, he was assigned to Macon County as a Protector Trainee. On December 15, 1962, he was transferred to Murphy in Cherokee County as a Wildlife Protector. Since his initial employment, he has completed four In-service Training Schools.

Jefferies is a member of the Murphy Volunteer Fire Department and the Cherokee County Rescue Squad. He is married to the former Evelyn Jane Jameson of Oak Ridge, Tennessee and has three sons. The Jefferies are members of the First Baptist Church in Murphy, North Carolina, where Mr. Jefferies is Training Union Director.

DIVISION ENFORCEMENT RECORD FOR DECEMBER, 1965

HUNTING & FISHING

Persons checked	30,128
Total prosecutions	855
Total convictions	823
Total cases not guilty	13
Total cases nol prossed	15
Total cases dismissed	4
Total fines collected	$7,805.00
Total costs collected	$7,120.80

BOATING

Boats checked	345
Total prosecutions	21
Total convictions	20
Total cases not guilty	1
Total cases nol prossed	0
Total cases dismissed	0
Total fines collected	$40.00
Total costs collected	$163.35

All fines and any arrest or witness fees are paid into the school funds of the counties in which the violations occurred, and no part of the fines or costs collected are paid to the North Carolina Wildlife Resources Commission or its personnel.

DEAR SIRS: I would like to give my sincerest of thanks to you for the publication of articles concerning the snakes of North Carolina. The snake myths and superstitions of North Carolina are a bit extreme, and without facts about snakes published for the public, ignorance and the human flaw of making a story "just a little bit better" (bigger) as it is retold makes myths and superstitions quite easy to come by. Please continue the series. MICHAEL GLYNN FIELDS, CHAPEL HILL

Needs Beech Nuts

DEAR SIRS: I would like to secure a small quantity of beech nuts. Sometime ago I sent $1.00 hoping that you might be able to pass it along to someone who could send me some? I have tried to secure nuts in our state but without success.

If you can help it will be greatly appreciated. JAY F. ROSE, MADISON, WISCONSIN 53711

Salt Marshes

DEAR SIRS: I would like to take this opportunity to congratulate the North Carolina Wildlife Resources Commission and particularly Mr. Otto Florschutz, Jr. on his December article entitled, "Wildlife Hunting on Salt Marsh Impoundments."

A number of years ago I was contacted by Mr. Florschutz and reminded of the potential wildlife damage that the Pamlico County Health Department was creating in their ditching program for the control of salt marsh mosquitoes. With the able assistance and guidance of Mr. Florschutz and his superiors, the Pamlico County Health Department entered into a cooperative program with the N. C. Wildlife Resources Commission to construct an experimental marsh impoundment of thirty-five acres which proved to be successful and led the way for the 800 acre Pamlico Point Impoundment which was completed in 1964, that has not only given control for salt marsh mosquitoes, but has created an excellent wildlife area that was opened to the public whereby our growing list of water fowl hunters have had an additional place to pursue their desire of knocking out a duck or goose.

Since January 1, 1965, the Pamlico County Health Department has continued the impoundment program and have recently completed three impoundments, one of 70 acres, 650 acres, and 123 acres on privately owned land which will give this agency protection against the breeding of salt marsh mosquitoes as well as to enhance the value of these lands. It is the policy of this department to impound properties, both public and private, whereby the owners would enter into a cooperative agreement with their furnishing all necessary pumps and maintaining water levels of not less than 8 inches or more than 18 inches and the department constructing the dike. Through cost analysis, it has been revealed that it cost approximately $6.32 per acre more to dike than to ditch similar and suitable areas.

Again we would like to thank Mr. Florschutz for his initial and continued assistance in this new program not only in Pamlico County but in other areas where similar operations are being pursued. C. J. McCOTTER, R. S., BAYBORO

PREDATORS

• continued from page 12

in effect and one of the recommendations Dr. Hubbard made was that predators be allowed to live."

Hayes pointed out that tularemia can be transmitted from the rabbit to man with serious results. "One way for a hunter, for example, to tell if a rabbit is infected is to look at its liver," Hayes said.

"If the rabbit is sluggish, or won't jump (what the beagle people call 'remaining on the squat'),

and if the animal's liver is white-speckled, then it should be handled with rubber gloves," Hayes continued. "Tularemia also can be transmitted to man by any ticks found on the animal," he added.

CREEL CENSUS

• continued from page 17

trip per year.

The main point for presenting both data projections is not to convince the reader with incontroversial proofs, but merely to impress upon him the fact that sport fishing in the inland waters does add up to a very solid pillar underlying the economic life of North Carolina.

WALNUTS

• continued from page 20

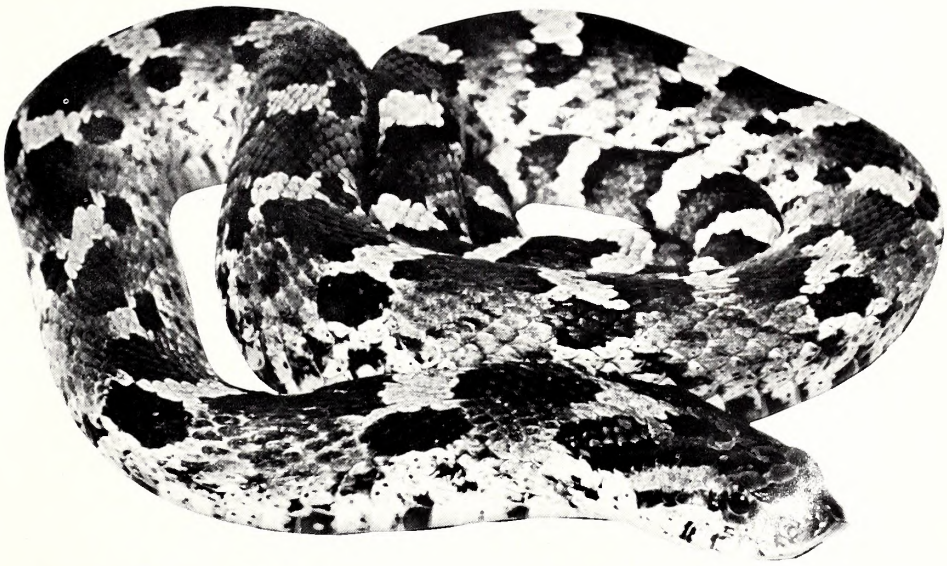
few years. Since wide spacing between trees is desirable, rows of trees 20 feet apart may be alternated with four rows of beans (see photo). Trees are spaced 14 feet apart within the row.

Walnut is used primarily for furniture and for plywood panelling, but it also has many other uses. It is historically famous for use in gunstocks. Walnut makes a good shade tree and practically everyone is familiar with the edible nut which is a delicacy for both man and wildlife. It is estimated that around 700,000 pounds of walnut kernels are produced annually by farmers in six counties of southwest Virginia and east Tennessee. This provides an additional source of income as well as helping wildlife.

The North Carolina Division of Forestry now has a supply of stratified walnuts for distribution. The price of these nuts is 75 cents per package of 25, postage prepaid to any part of North Carolina. As sportsmen, the readers of *Wildlife in North Carolina* might well consider taking a bag or two of these nuts for planting in natural openings on their trips afield. This small individual gesture, when multiplied many times, can make a significant contribution to walnut's comeback within the state. Interested parties should contact the State Forester, Raleigh, for details or write directly to the Nursery Superintendent at Clayton.

Walnut planting in North Carolina is being encouraged by the American Walnut Manufacturers' Association who furnish part of the nuts for planting and by the Hardwood Research Council. The Council will match any interested landowner on a tree-for-tree basis for walnut seedlings purchased at the state nursery and provide up to 5,000 free trees to any one individual starting next year. So if you have crop land that you want to take out of surplus crop production, here is a source of planting stock available at half price. This may sound like a long range venture, but when you consider the small investment in comparison to the return it is a very good investment indeed!

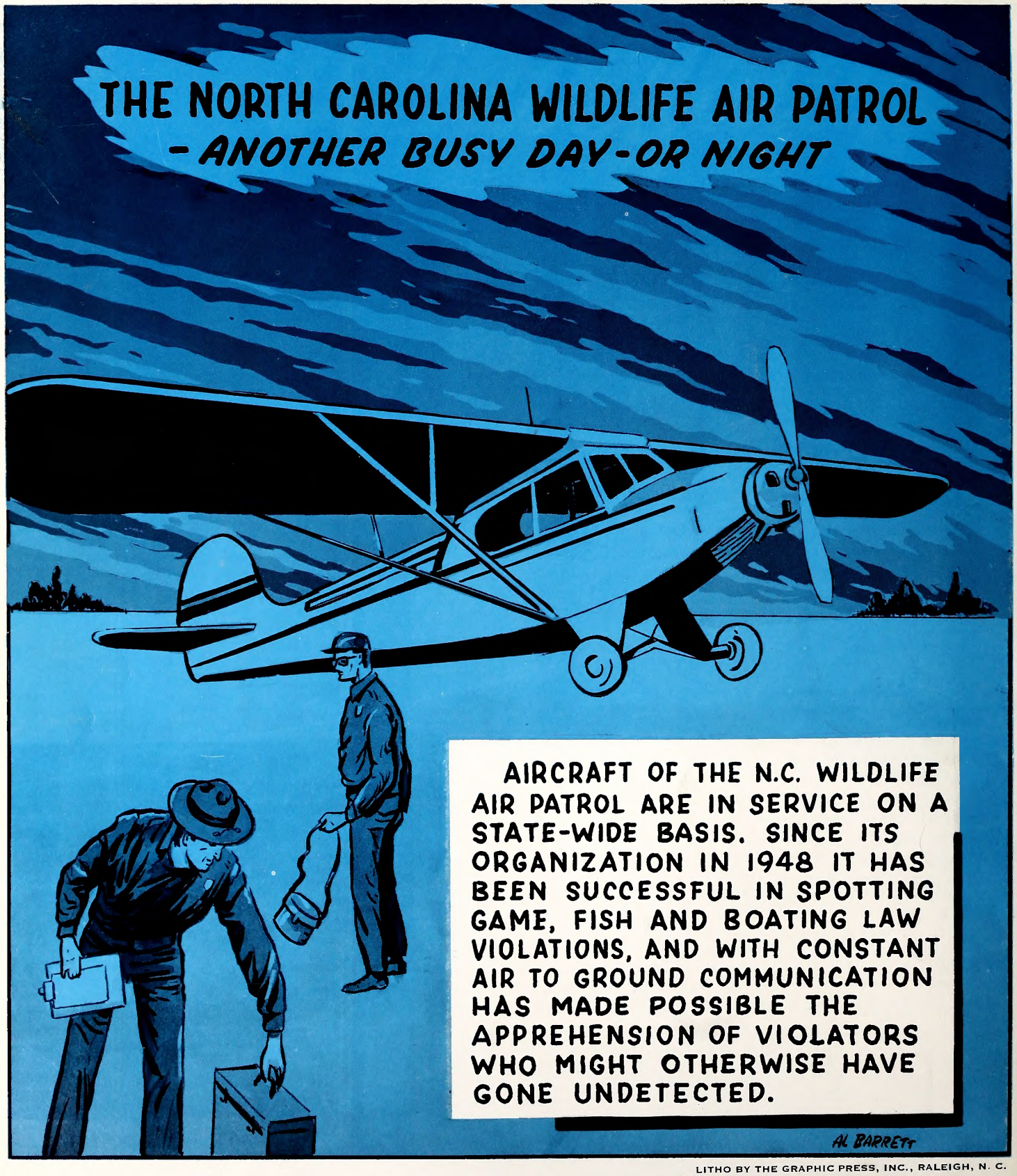
* Grateful acknowledgment is made to Mr. Stephen G. Boyce, Assistant Director, Central States Forest Experiment Station, Columbus, Ohio; Mr. Donald H. Gott, Executive Director and Secretary, American Walnut Manufacturers Association, Chicago, Illinois; Mr. Phil A. Griffiths, Assistant State Forester, North Carolina Division of Forestry, Raleigh, and Frank B. Barick, Chief, Division of Game, North Carolina Wildlife Resources Commission, Raleigh, for reviewing this article, suggesting valuable changes and furnishing photographs. H.J.D.



WRONG REPTILE. If you thought the photo on page 23 of the January issue of Wildlife was that of an eastern hognose snake as stated, don't be upset. Co-author Palmer says that it actually is a southern hognose. There are minor differences as shown in the above photo of the eastern hognose, *Heterodon platyrhinos*.

At its January, 1966, meeting, the Wildlife Resources Commission elected as its new officers James A. Bridger, Bladenboro, Chairman (center); Oscar Ledford, Franklin, Vice Chairman (right); and Jay Waggoner, Graham, Secretary.

Winners of last fall's Wildlife subscription contest are shown here being congratulated by Commission Chairman Hugh Chatham. Left to right are Oscar Chadwick, 1382; A. E. Jones, 1781; John O. Brown, 2045; and first place winner John Willis, 2055.



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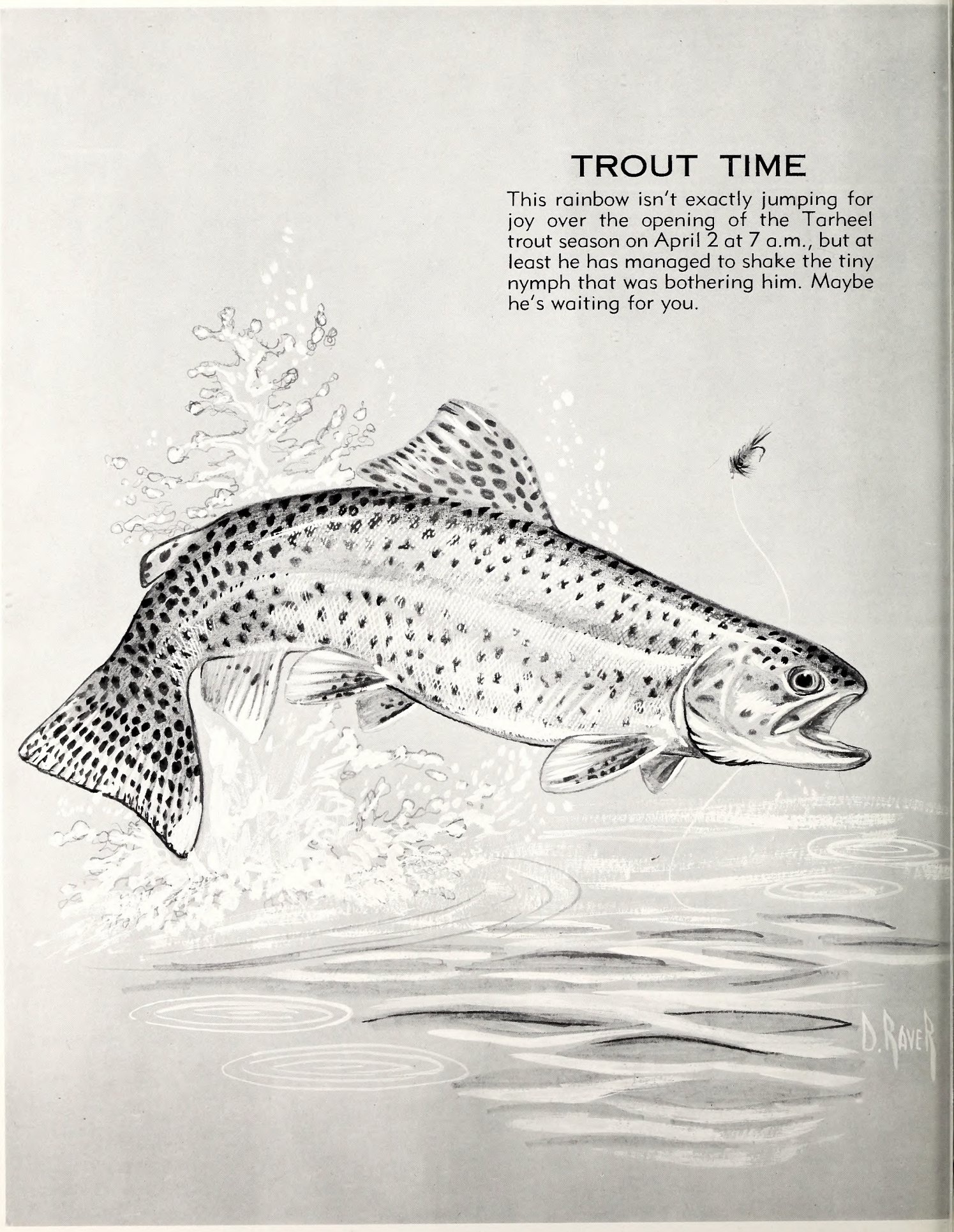
Wildlife IN NORTH CAROLINA

APRIL, 1966

TROUT TIME

This rainbow isn't exactly jumping for joy over the opening of the Tarheel trout season on April 2 at 7 a.m., but at least he has managed to shake the tiny nymph that was bothering him. Maybe he's waiting for you.



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WILDLIFE IN NORTH CAROLINA recognizes the need for close cooperation between State and Federal conservation agencies and the people who hunt and fish—to bring about a restoration of our renewable resources. The Editor gratefully receives for publication news items, articles, and photographs dealing with the North Carolina out-of-doors, but reserves the right to reject materials submitted. Full credit is given for all materials published.

* * *

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* * *

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Wildlife IN NORTH CAROLINA

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APRIL, 1966 VOL. XXX, NO. 4

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JOHN PARKER - - - - - OUTDOOR SAFETY

Unless you've been in its midst, it is difficult to realize the sweeping destructiveness of wild fire. Spring months are peak woods fire months in North Carolina with most of the flames started by human carelessness. Although controlled burning is a useful tool of the forest game manager, it must be used with extreme care and under exact conditions. Be careful. Transparency by Jack Dermid.

Water Trees Versus Progress

by Norman Lantz
Inventory Forester

The progress of civilization often conflicts with the preservation of natural resources. An evaluation of wetland forests may help bring one such problem into better perspective.

VERY likely many people in Piedmont and Mountain counties of North Carolina have never seen a tupelo gum or a cypress tree. Even persons in the Coastal Plain who look at them daily may not really recognize them. Wetland timber has been largely ignored and its value underestimated by many professional foresters up to now.

There is concern in many parts of eastern North Carolina because the typical tupelo-cypress swamp is declining. The shadow of death has already been cast on thousands of acres as a result of various projects through the hearts of former natural streams and swamps. These activities are draining the swamps of their life blood—water.

Botanical manuals describing the location of tupelo-cypress will always mention water since these two species of trees are acclimated to a water environment. For commercial growth of each, water is necessary and both must have surface water for long periods each year to maintain maximum growth. Tupelo and cypress make the best growth in running water.

Seed dispersal is largely accomplished by water, and seed germination takes place in a watery atmosphere. The tiny cypress seed must be in or on a soil saturated with water for a period of one to three months to germinate. The initial root system of both species is very shallow and slow in penetration and even when grown under nursery conditions—a drier site than its normal environment — cypress still exhibits a shallow, slow penetrating root system. One week after germination the root penetration of a cypress seedling is about one and a half inches, and even by the end of the first growing season it usually does not exceed three and a half inches. Tupelo seeds are stratified for a period of three months in nursery regeneration, then placed into wet soil in layers and kept at a low temperature. This is the same treatment that they must receive in nature to reproduce.

Tupelo and cypress trees display many other physical features geared to a water habitat. Both are relatively thin-barked, and have prominent, enlarged lower tree trunks that botanists say are used in their demands for oxygen in a water existence. The foliage of tupelo-cypress is soft, thin and succulent without the waxy epidermis found on the leaves of the more upland tree species.

Water quality and availability are improvel by tupelo-cypress forests since stands of tupelo-cypress slow the rapid runoff of surface water, causing it to deposit much of the suspended silt burden. This silt is deposited along the entire forest swamp, rather than at the stream outlet. This alluvium—some of the best soil in the world—is in turn used by the forest to grow a commercially valuable product. Quality tupelo and cypress are in high demand and in a limited supply.

Most of us are familiar with the rot-resistant qualities of cypress wood. It is in great demand for construction where exposure to weather is a factor. Boats, bridges, piers, outdoor furniture, residential construction — these are only a few of the many uses of cypress wood.

The contribution of tupelo is, unfortunately, not as widely known and its importance is probably less appreciated. Tupelo root wood has been used extensively as floats on fishing nets and you may have seen it in the grocery store as food containers or at the sporting goods store as water skis. Tupelo veneer has been stained in recent times and shows up in many homes as walnut, poplar or mahogany furniture and paneling. Tupelo furnishes the basic raw material for a significant portion of the eastern Tarheel economy—hardwood veneer. The production of softwoods (primarily pines), is now in line with the demand, which has resulted in a less favorable price situation. The supply-demand ratio is now very favorable for hardwood products, and the major source of supply is the wetlands of the east. North Carolina now leads the nation in the production of hardwood plywood, much of it produced from tupelo.

Tupelo veneer is white with a smooth, uniform grain, making it a prime choice of the furniture industry. North Carolina also leads the nation in the production of wood furniture with wood products, collectively, providing our greatest source of wealth.

Tupelo-cypress swamps and other wetlands are of tremendous importance to many species of wildlife. We would have to look hard and long to find an area richer in natural resources than the wetlands of eastern North Carolina. Here is a sportsman's paradise with the clean, black-stained waters (where they have not been drained or polluted) providing the angler with a variety and abundance of fish that is almost unmatched

in other parts of the state. Native wood ducks and migratory waterfowl find food, water, shelter and sanctuary in the swamps and hardwood bottoms that are flooded during the winter months. The swamps are particularly vital to big game species, such as deer, bear, and turkey, because of the standing water during all or a large part of the year. The water conditions provide escape cover from free-ranging dogs that can be a limiting factor in the management of big game. In this respect, the eastern swamps are natural wildlife refuges; in fact, state and federal wildlife agencies are trying to duplicate these conditions when they establish wildlife refuges or management areas elsewhere. It is readily evident that economically and esthetically important wildlife resources of eastern North Carolina are inseparably related to the water conditions with the swamps playing the lead role. The requirements for this role are so demanding that no substitute is available when swamps are drastically altered.

Consideration should be given to swamps as reservoirs of surface water during the drier parts of the year. This conservation of water assists in maintaining stream flows and ground water levels for a longer period of the year and such water areas also serve as natural fire breaks.

What is the future of the drained tupelo-cypress forests? When the abundant surface water is permanently removed, we can expect an abrupt decrease in the rate of height growth. With this sudden loss of water, the tupelo-cypress will gradually be replaced by other forest vegetation. Present stands will decay and stagnate, putting on little growth. The top limbs of tupelo will slowly die and slough to the ground. Cypress foliage will thin out to an equilibrium with the decreased amount of available water to the root system.

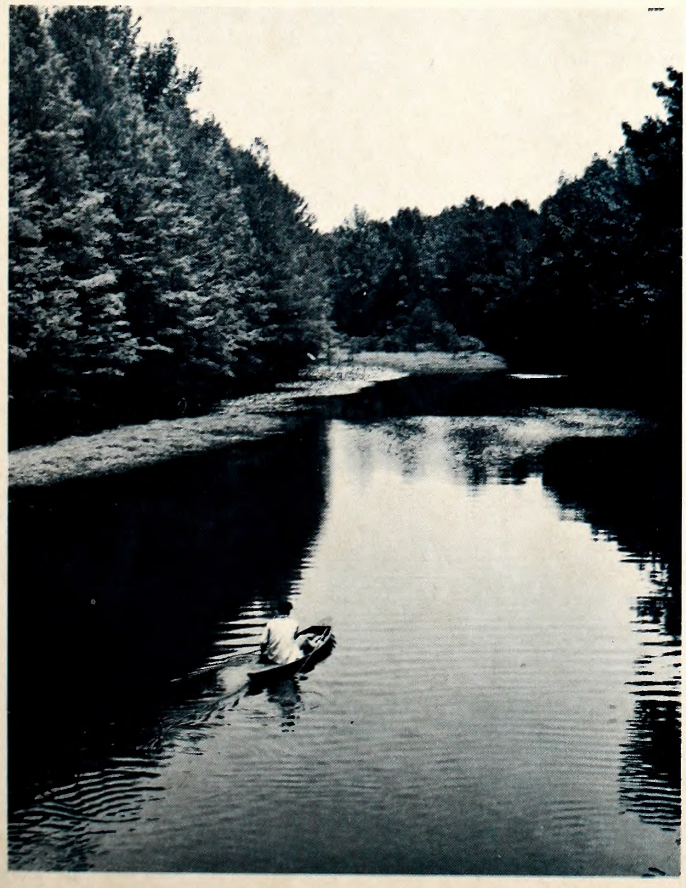
Summer radial growth in both species will be sharply reduced, except in very wet periods when some growth will be sustained. Reproduction will occur only in some of the wetter depressions. But dry, hot summers will decimate most of these tender young sprouts. Tupelo-cypress stands will not be able to survive this continuing drought.

In the drier parts of the drained swamps there will be an invasion of vines of Japanese honeysuckle that will replace more desirable forest vegetation. The tupelo-cypress in many of these drained areas will follow the passenger pigeon and ivory-billed woodpecker to extinction.

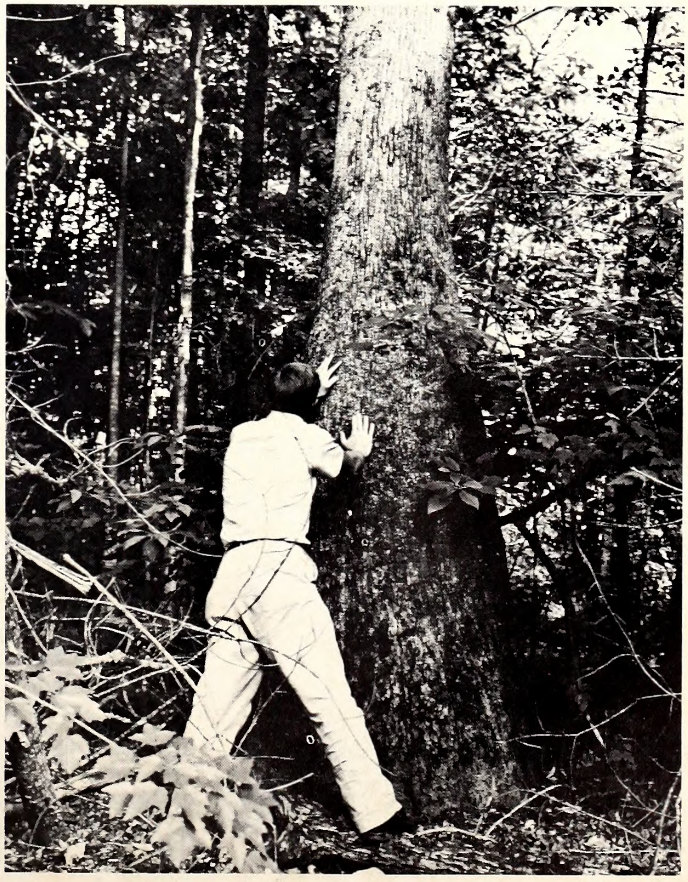
This is the fate of these great swamps in many drained areas. Accompanying them down this one way road to oblivion will be another vital portion of our dwindling wildlife habitat and a significant loss to the economy of the state's greatest industry.

A natural tupelo-cypress forest is a home for fish and game; a reservoir of water with a natural purification system; a source of raw material for industry; a place of solitude and reverence.

The solitude and sanctuary that swamps provide may not be reason enough to justify their preservation, but certainly their loss would leave us poorer in many ways. We must take a long look before we act whenever habitat is to be changed.



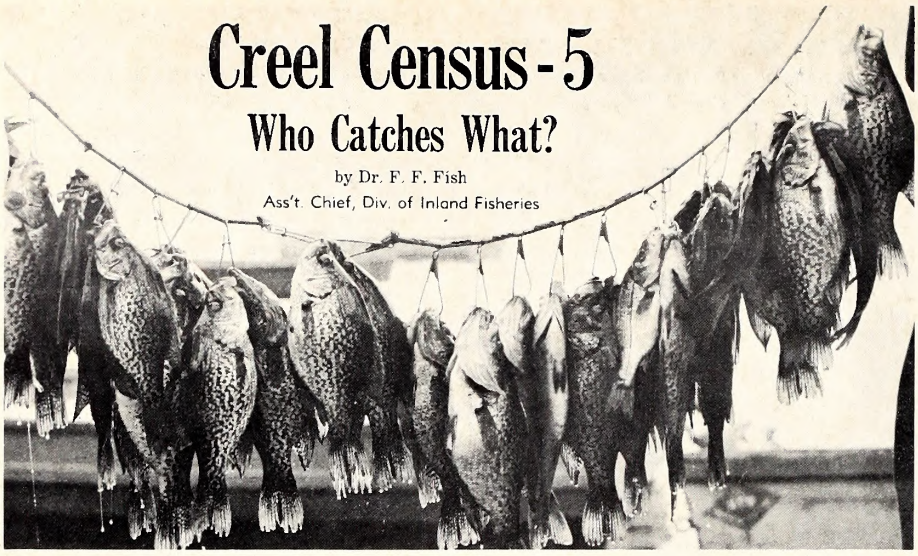
Game Biologist George Burdick indicates the former water level before swamp drainage. This change of environment will mean a sharp decline in the production of this valuable tupelo timber resource plus a loss of swamp wildlife habitat.



Creel Census-5

Who Catches What?

by Dr. F. F. Fish
Ass't. Chief, Div. of Inland Fisheries



HAVING pursued the general subject of North Carolina's fishermen of the inland waters perhaps to the point of boredom, it seems appropriate at this time to change the subject from the fishermen to the fish that they take from the inland waters.

During the Statewide Creel Census, the interviewing wildlife protector recorded the number of fish of certain general categories found in the angler's creel at the time of contact. When compiled into general totals, these records yielded a reasonably accurate picture of the proportionate fraction that each category of fish contributed to the total catch of all fishes taken from the inland waters.

These data must be kept in terms of percentages—they cannot be transposed into absolute numbers for, as when calculating the miles travelled or the dollars spent, there is no reliable estimate of the number of trips each fisherman makes during the year. In this case, there is the additional limitation that the total number of fish caught during the trip on which the angler was contacted also is not known—all we have is the story up to the time of contact. We can logically assume, however, that data taken at the time of contact reliably indicate the proportionate kinds of fish taken on the entire trip—even though they obviously tell us nothing about the total number. Therefore, if all data are held in terms of percentages, the conclusions should be valid.

When planning data analyses, it seemed reasonable to assume that the nonresident angler might show a decided preference for only certain kinds of North Carolina fishes. Also, the licensed resident might take home a quite different selection of fishes than does the unlicensed county resident fishing with natural baits—and the "bent-pin" set represented by minors could very logically differ widely from all others in their choice of catch. So, the creel data for these various categories of fishermen were kept separate. Should the reader care only for the kind of fish and not the license category of the fishermen who caught them, all he needs do is lump the separated data into the "Statewide Total for Individual Fishes." In the meantime, should a reader happen to be curious about who caught what, he too can find his answer among the separated data.

There were several ways in which this story might be told and it was a bit difficult to decide just which manner would be most effective. Right or wrong, it was concluded that most readers would be primarily interested in comparisons of the relative catches of the different fishes commonly taken by rod-and-reel.

The catch data summarized in Table 5-A, therefore, were all calculated in terms of a single figure—the statewide total take by rod-and-reel anglers of *all* fishes. All entries being of a common ancestry, so to speak, means that any item of this table can be compared directly with any other item.

When interpreting these data, just remember exactly what they say. For example—they say that all the crappie caught by licensed resident anglers represented 13.9 percent of *all* the fish caught from the inland waters of North Carolina by rod-and-reel. Because these data are all of common ancestry we can conclude that, because the 13.9 percent for the crappie is roughly three times the 4.5 percent represented by the catch of catfishes by unlicensed county residents, the total number of crappies caught by the licensed resident anglers is just about three times the total number of catfishes taken by the unlicensed county residents. In the same manner, the total catch of mountain trout by all anglers (3.5 percent of the statewide total inland water rod-and-reel harvest) is approximately three times the 1.1 percent represented by the total catch of white bass. So, from the data of Table 5-A, you can draw any comparisons that happen to strike your fancy. These data will not tell you what the total take may have been numerically, but they do tell you its relative magnitude.

(Now, having familiarized yourself with the workings of Table 5-A, do not stray off course and conclude, for example, that the resident licensed anglers caught 13.9 percent of the crappie caught from the inland waters—that is *not* what these particular data say. The creel data could have been expressed in these terms and they will be in a later article concerning the crappie alone—but if they had been so expressed herein the catches of one fish could not be compared with those of another—which is the objective of this article.)

These catch data produced some surprises. Apparently the earlier assumptions concerning prefer-

Table 5-A

PERCENTAGES OF THE TOTAL STATEWIDE ROD-AND-REEL CATCH FROM THE INLAND WATERS REPRESENTED IN THE TAKE OF VARIOUS FISHES BY INDIVIDUAL LICENSE CATEGORIES.

Kind of Fish	Resident Licensed Anglers	Nonresident Anglers	Unlicensed County Residents	Minors	Statewide Total For Individual Fishes
Sunfishes*	24.9	0.8	16.3	1.4	44.0
Crappie	13.9	0.3	4.0	0.4	19.1
White Perch	9.6	0.7	2.0	0.2	12.6
Catfishes	5.1	0.2	4.5	0.2	10.0
Largemouth Bass	3.0	0.3	0.3	<0.1	3.6
Mountain Trout	2.5	0.1	0.6	0.3	3.5
Carp	0.7	<0.1	0.9	<0.1	1.6
White Bass	1.1	<0.1	<0.1	<0.1	1.1
Striped Bass	0.8	<0.1	<0.1	<0.1	0.8
Pickerel	0.6	<0.1	0.2	<0.1	0.8
Walleye	0.2	<0.1	<0.1	<0.1	0.2
Smallmouth Bass	0.2	<0.1	<0.1	<0.1	0.2
Shad	0.2	<0.1	0.1	<0.1	0.2
All others	1.5	0.1	1.1	0.2	2.9
Percentage of All Fish Caught Statewide Taken by License Category	64.4	2.6	30.2	2.8	
Percentage of All Anglers Represented by License Category	48	5	39	8	

*As used herein, "sunfishes" include only bluegill, redbreast, rock bass, warmouth, yellow perch, flier, stumpknocker, and other minor varieties of sunfishes.

ences for certain fishes on the part of certain license categories were without foundation for the catch of all fishes seems to be pretty much on an "across the board" basis and no fish appears to be the exclusive interest of any single category of fishermen. With the possible exception of the carp, the proportionate take of fish agrees surprisingly well with the proportionate number of anglers in each license category.

The surprises revealed by these data also should include the importance of the sunfishes and that of the catfishes in the statewide rod-and-reel catch.

If the sunfish category is consolidated to include the crappie and the white perch under the single title of "pan fishes"—as is done in the current Fishing Regulations — then this single category accounts for *three-fourths* of all fishes taken from the inland waters by rod-and-reel. And it isn't the "bent-pin" minors nor the unlicensed worm fishermen that is taking the bulk of the panfishes—the licensed resident fishermen take home 64 percent of all panfishes caught even though numerically they comprise but 48 percent of all anglers. There can be no doubt about the popularity of the panfishes with the rod-and-reel anglers!

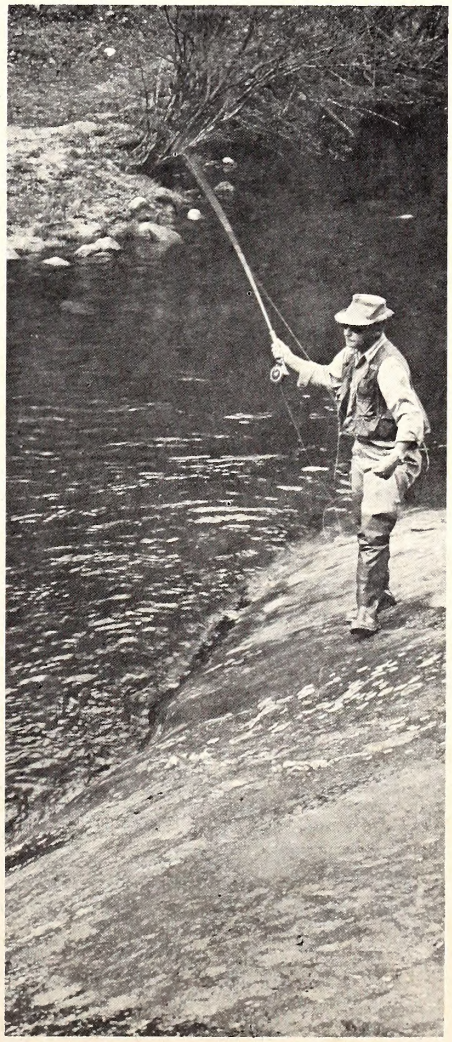
The catfishes contributed another surprisingly high percentage of the total rod-and-reel catch—ten percent—which, for comparison, numerically is some two and one-half times the entire take-home catch of largemouth bass. These data include no catfish taken by trotline nor in catfish traps—only those taken by the rod-and-reel anglers. Again, the licensed resident fishermen take the bulk of the catfishes—to be exact, 5.1 for every 4.5 taken home by the unlicensed county resident.

And so it goes—you can pick out your favorite fish and the data of Table 5-A will tell you just where it stands in the statewide catch of all fishes.

Finally, one more comparison and we will close up shop and go home. The figures along the bottom line of Table 5-A represent the frequency of the type of license category stated in the respective column heading in terms of the percentage of all inland-water anglers. We last saw these same data in a pie diagram contained in the first article about the Statewide Creel Census. (October, 1965 *Wildlife*) The figures contained in the next to the bottom line (which are merely the total of all figures from the column above) give the percentage of all fishes caught by the license group named in the column heading. Comparing the figures in these two rows yields the relationship between the number of anglers in the license category and their respective catches. For example, the unlicensed county residents comprise 39 percent of the entire inland-water fishing public, but they take home only 30.2 percent of all fish taken by rod-and-reel.

Trout fishermen limit their activities to some 26 Tarheel counties. A look at line six in Table 5-A will reveal what percentage of the total catch were trout.

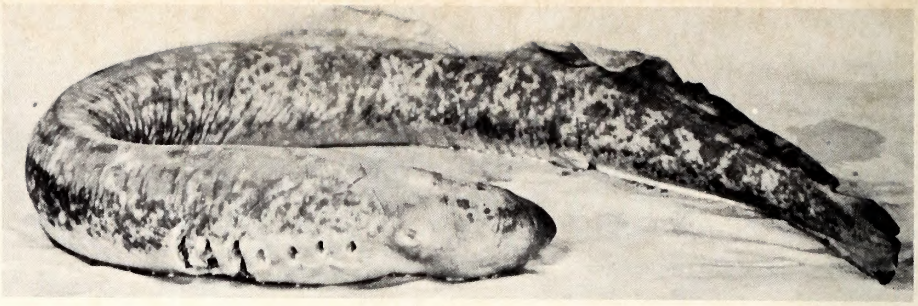
JOEL ARRINGTON



Quiet Death

THE SEA LAMPREY

by James Davis
Fishery Biologist



LUTHER PARTIN

This is a photo of a preserved lamprey. The last three gill openings have been enlarged to allow preservative to enter.

SEA lampreys, *Petromyzon marinus* (Linnaeus), are relatively unknown to most people and the average fisherman will not see one in a lifetime of angling. Eel-like in appearance, but they are in no way related to the familiar American eel. Lampreys belong to a group of very primitive fishes, the Cyclostomes, which means round mouth. Fossil remains of early fishes are similar to our present day sea lamprey. Their bodies are unusual in shape, having no gill covers, scales, hard bone, paired fins, or even a lower jaw. They have, however, a soft cartilaginous skeleton and well-developed dorsal and ventral fins. When closed, the mouth is a longitudinal slit but forms a disc armed with horney teeth when open. There are seven open gill slits on each side of the body directly behind the eyes. Lampreys can hardly be mistaken for any other species of fish.

Small lampreys are white on the underside and bluish-black on the dorsal side, but as they grow older, the underside turns a dirty gray with the dorsal side taking on hues of brown, green, red and blue over an olive-brown background.

The sea lamprey ranges along the Atlantic Coast of North America and Europe and is found as far north as Greenland and as far south as Florida.

The critter has a very interesting life cycle. During the spring months of March through May, or when the water temperature reaches 50°F., the sea lamprey moves into shallow-water streams to spawn. It ascends water falls, if they are not too high, by attaching itself to rocks with its oval disc and working itself upward. Having located a suitable spot, usually with a rocky bottom, the male and female construct their nest by moving the rocks with their sucker-like mouths. Once completed, the nest resembles a shallow depression similar to a bass bed. After nest building activities have been finished, the female spawns in the newly constructed depression. The number of eggs extruded varies up to 236,000, depending upon the size of the female. After spawning, the parent fish die and are consumed by the forces of nature, mainly decay and predation.

In about 14 days the eggs hatch. The young at this stage are called ammocoetes and are blind and toothless. After hatching, these tiny larvae remain in the nest for several days before moving onto an adjacent mud or silt flat. Here they burrow into the bottom and feed on microplankton until they reach six inches, which takes three to four years.

After the ammocoetes larva reaches a length of around six inches, it undergoes a transformation and becomes an adult. Some of the changes that take place during this transformation period include the eyes becoming functional, the mouth developing a full compliment of 112 to 125 rasping teeth, and the digestive tract being altered to facilitate the change in diet.

After this change, the young sea lampreys move downstream to the ocean to begin their life as parasitic fish. Here in the ocean they prey on other fishes such as the American shad, striped bass, and shark by attaching to the fishes with their sucker-like mouth. At the point of attachment, the scales and skin of the host fish are rasped away. Once the blood supply of the host fish becomes significantly decreased, the host dies and the lamprey seeks out another meal.

During this period of growth in the ocean, the lampreys become exceptionally strong swimmers, making it easy for them to seize new host fishes. When they are not feeding, they are sometimes found attached to driftwood or even to the hull of a ship.

Sea lampreys mature when they reach two to three feet and weigh between two and three pounds. At this time, they get the urge to find some suitable freshwater habitat in which to spawn, so they move inland—sometimes as much as 200 miles—spawn and die.

Sea lampreys are seldom taken on hook and line, thus are rarely encountered by sport fishermen. Commercial fishermen periodically pick them up in their nets or when the lampreys are attached to some host fish which is being sought.

In North Carolina they have been collected from the Cape Fear, Neuse, Roanoke, and Chowan Rivers as well as from the various sounds along the coast.

In past years, this fish was considered a delicacy on the table, but today it would be considered a rare meal. Today the immature sea lampreys are used for bait in the northern areas of the United States; however, the primary use for both larval stage and adult is in biological laboratories where they are studied because of their primitive form.

If you have never seen one of these fish, be on the lookout; you could see one the next time you are near the coast.

Southeastern Crow Shoot

by Malcolm Boren

STAFFORDS OF HENDERSON
HENDERSON, N. C.

Billy O. Williams, Henderson Jaycee President, holds the first place trophy in the singles division. Others shown on table are second, third, and fourth places.

ONCE again the Southeastern Crow Shoot and Calling Contest will be held in Henderson, North Carolina, and will be sponsored by the local Junior Chamber of Commerce. By a straw ballot among last year's participants, the date has been changed from early October to April 22 for the calling contest. The shooting event will follow the next day, Saturday, April 23. The National Guard Armory will continue to serve as headquarters with registration to begin at 6 p.m. on the 22nd. A drawing for shooting territory and a Jaycee driver will follow registration. Registration and drawing will be continued at 7 a.m., just prior to the singles class on Saturday.

This year an extra effort is being made to bring in Virginia sportsmen, as a good part of the shooting area is in the Old Dominion State. Almost all of the 18 crow enthusiasts taking part in the 1965 shoot indicated that they will return for the spring shoot. Four Goldsboro shooters polled their hunting and fishing club and had keen interest in 10 of 20 members. Much work went into the organizing of the first shoot, and the Jaycees are looking forward to conducting the top crow shoot in the country this year.

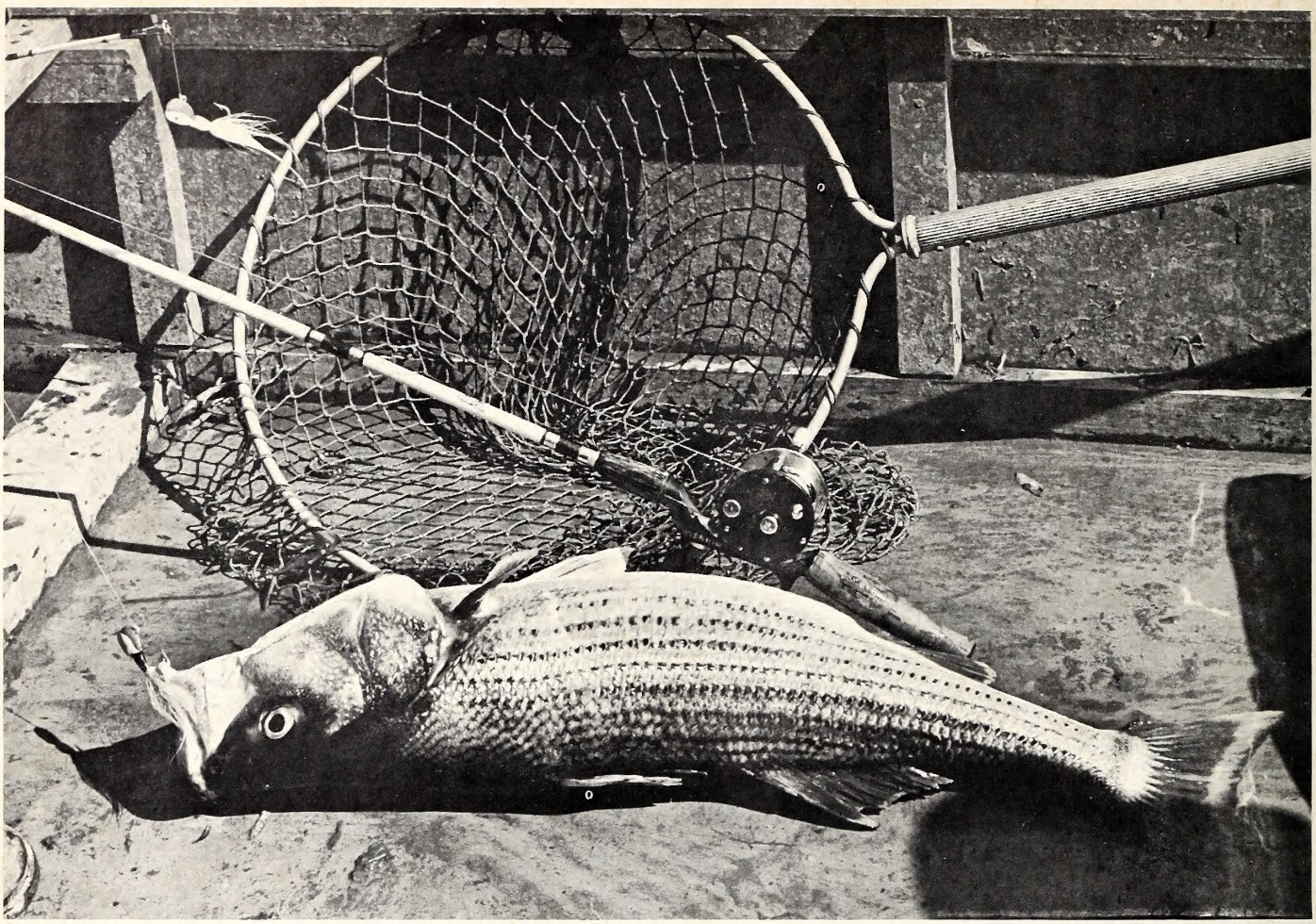
The possibility of dividing the singles and doubles classes into two days was overruled as the majority of Jaycees members would not be available to assist except on Saturdays. Therefore, each of the two shooting classes will be of 2½ hours duration with a three-hour break in between. For those who like to shoot in the singles and with a partner in doubles; the effort exerted adds up to an all day type crow hunt. Most of the shooters found several differences in competitive shooting and the regular sort of crow hunting.

Time being the greatest factor, the contestants found themselves faced with snap decisions each time a shooting stand was made. Selecting stands was particularly important. Getting into the woods and finding a spot suitable for cover with just the right amount of opening for shooting was often difficult. Thick undergrowth was avoided as downed birds were harder to locate. Low pines were preferred over hardwoods. Most stands averaged five minutes with six to eight stops worked into an hour's time; so, some degree of scurrying about is going on. The gun and ammunition preferred were a 12 gauge choked automatic using 7½ HV.

For additional information, contact Mr. Billy Williams, c/o Pepsi-Cola Bottling Company in Henderson, North Carolina. Drivers will be available to accommodate the first 40 entries signed. Any sportsman using a mouth caller and possessing a state hunting license is eligible and welcome to participate.

The object of the whole affair, the crow. Sport, fellowship, competition are the prime elements of the contest.

FRANK MOONEY



Landlocked Stripers on the Spawning Grounds

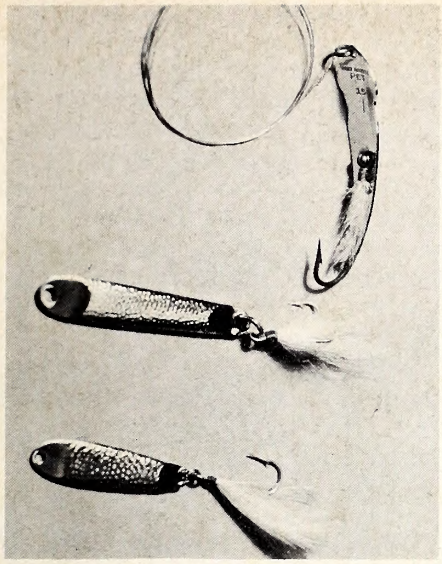
by Frank Mooney

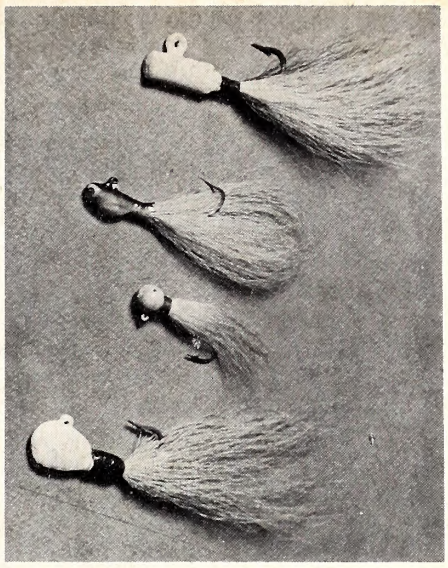
PHOTOS BY LUTHER PARTIN

I CAUGHT my first striper the latter part of April last season and even by this date, stories had already filtered through the grapevine of successful trips. Rockfish, from my experience, seem to seek out the tributaries earlier than most people realize. The smaller fish presumably are the first to ascend the incoming streams and suffer the heaviest toll from anglers; then the monsters follow suit with less interference — guess that's one advantage of being overweight, for a fish, that is! From my observations the lunkers are caught more between the peak of the season and until the time they return to the lake.

The Dan River from Milton to Danville apparently serves as a primary spawning grounds for Kerr Reservoir. When the surface is calm, giving maximum visibility, I have seen rockfish caudal fins wide as boat paddles clear the water momentarily during the spawning procedure. Most boats are launched at Milton; actually the concrete ramp at Milton is the only access area between Milton and Danville. The river runs near Blanche but there is no access area there. Boats are launched between these points but it's that "slip and slide down the bank" method. This rockfishing is fast becoming a traditional event for many anglers in the Milton area. I have seen cars and trailers from far away as High Point, North Carolina, and several distant places in Virginia.

One cannot catch as many fish as in the Weldon area, but on the average they run larger. Frank Wright and I one morning caught eight rockfish, the largest nine pounds with the smallest a shade under four. On several ex-





At left, are three spoon-like lures that will take the striper but may "hang up" in snaggy water. The four jigs at right seem much more popular. Size and color vary, so take a good supply.

cursions we caught fish weighing from four to seven pounds. The largest fish taken so far was caught near Danville, Virginia, tipping the scales at a whopping 26 pounds. A 23-pounder also was caught this year in that area. The man that weighs and checks fish sometimes at Milton for the Wildlife Resources Commission told me last year that biologists turned up fish better than 30 pounds during a fish population check just above Milton.

Last season's anglers were repeatedly hindered by muddy, high water. On several trips to Milton we returned after seeing the condition of the river without launching the boat. About 5:30 a.m. one somber April day, Bill Zimmerman and I launched my boat at Milton after debating whether to put in or go home. The river was a couple of feet above normal but not real muddy. Since the water was high we had no trouble ascending the first rapids. I will offer this word of advice to the novice when ascending the first rapids: stay on the *left side* close to the trees that extend over the water. When the water is normal or low you can easily shear a pin or damage the motor in the turbulent rocky rapids. I generally stop at the second rapids sometimes anchoring and fishing a while then usually float downstream and cast. The water seemed clearer as I cut the motor at the second rapids. "Maybe the water is okay", I told Bill as he started casting. "It looks clearer since the sun came up." He nodded, casting his white doll fly jig. We seemed to have the river to ourselves; no other boats.

Bucktails and doll flies are the only lures that will consistently take the striper on their spawning grounds. Lures with treble hooks are usually a waste of time fishing in that snag-infested water. They have been caught on other plugs but not enough to warrant their naming. I saw a happy angler just after he had caught an eight-pound rockfish on cut bait fishing for catfish. The fish are partial to doll flies compared to other bucktails. Many of the lead-heads seem to be too large and difficult to use due to shallow water. The smaller lures slide over the logs and rocks better.

On several jaunts I have found the smaller doll fly to be their favorite. Some anglers swear by white lures and some yellow. Personally, I think most days it doesn't matter; it's whichever you have the most confidence in. We had been casting over an hour before Bill hung one near the boat. He hollered "drop the anchor; I got one if I can hold it." Line sizzled through the water as the monster tore downstream. We had left in a hurry that morning and I forgot my camera and landing net. The rockfish went downstream, upstream, across and sideways before it consented to being led to the boat.

Without the net I knew it would be rough getting the fish in the boat. I groped for his gills; the fish rolled as my hand touched it and shot away from the boat. Bill pumped the fish boatside again; this time I swung it aboard. I weighed the monster while Bill caught his breath; the fish had tired us both. It weighed a few ounces over 10 pounds. "Let's troll through that spot," I told Bill, drooling at the thought of hanging into one of that caliber.

When you catch a fish it pays to work the surrounding area again because usually there are more around. Due to the high water, the river was full of debris, so we waited until the last moment before putting our lures overboard. "Doggone, I'm hung —heck no! I got a fish," Bill grunted, having his hands full. The trip before this one I had caught all the fish and he was showing me up this trip. After a long, tough struggle, Bill finally got the fish close to the boat; the striper made a lunge tearing the hook free. It looked identical to the one chained to the boat. "I hated losing that fish", he said, "but I enjoyed playing it awhile."

That put me to wondering what I was doing wrong; my retrieve was the same pace as Bill's —and we were using identical lures. It never dawned on me until too late in the trip what I was doing wrong. The water was a couple feet above normal and I wasn't letting my doll fly get close to the bottom. Some days the rock love that bottom scraping method and Bill was plowing furrows. Usually I start my retrieve as soon as the lure lands due to the shallow water; but with the water being high I failed to go deep enough. Sometimes a fish will not move far to clobber a lure.

Fishing is hard work when pursued in the proper manner. I

should have observed that Bill was hanging his lure often and that I very seldom hit bottom. One slight difference can mean fish or no fish. It pays to watch the details. As we passed several fishermen on the bank, Bill cast toward them and hung into another striped monster. His spincast outfit sounded like a fire truck going full blast to a fire. I let the boat drift with the fish before lowering the anchor so Bill could get some of his fast-disappearing line back. That monster put on a show of brute strength and it took ten minutes before I was able to put my hand in its flaring red gills and heave the writhing form aboard. My hand scales strained to 12 pounds and 12 ounces. My landing net would have been nice but what I really needed was a gaff.

From the crack of dawn to 8 a.m. usually is the best time for the stripers on their spawning grounds. This elusive fish at times sulks around the snags and fallen trees near the bank then for some unknown reason you can catch them near midstream. Rockfish when "fighting" (spawning) usually surface midstream or very near it, perhaps explaining why when you catch one in the middle it is getting ready for that all important event in their life cycle. The rockfish reproduction urge must be a powerful drive; a few females are killed every year due to the spawning procedures of bucks hitting the roe in the abdomen apparently to help her release the eggs. I have caught bucks considerably banged up at this time of year.

Be sure when fishing the Dan River to carry plenty of shear pins and tools to change them in case of trouble. The river is shallow in most places with logs and other snags frequently in the entire stretch of water. A lure retriever such as the Mojo is a must for the fisherman unless he is well-stocked in lures. I have talked to disgusted anglers on several occasions that had lost all of their lures and had to return home before really fishing and exploring the spawning grounds.

Another safety precaution when motoring in snag-infested water is to travel with the motor in release position so if you engage a snag it can be skimmed over without too much damage. A friend from Roxboro hit a log a mile or two below Weldon on the Roanoke River and had to walk the bank back to the access area to get help. The motor was in lock position.

Rockfish reach their spawning grounds the latter part of April or first of May; the water temperature seems to be the main factor in their determining schedule. Since North Carolina and Virginia authorities compromised on the fishing rights on Kerr and Gaston Reservoirs it has gone a long way in clarifying things for anglers from both states. Virginia fishermen had to launch their boats at Milton and go upstream several miles before reaching Virginia waters and North Carolinians had to watch about going too far up and getting in Virginia. The Virginia line is a short distance above the second rapids. Thanks to both states the striped bass anglers can fish in harmony. ⬍

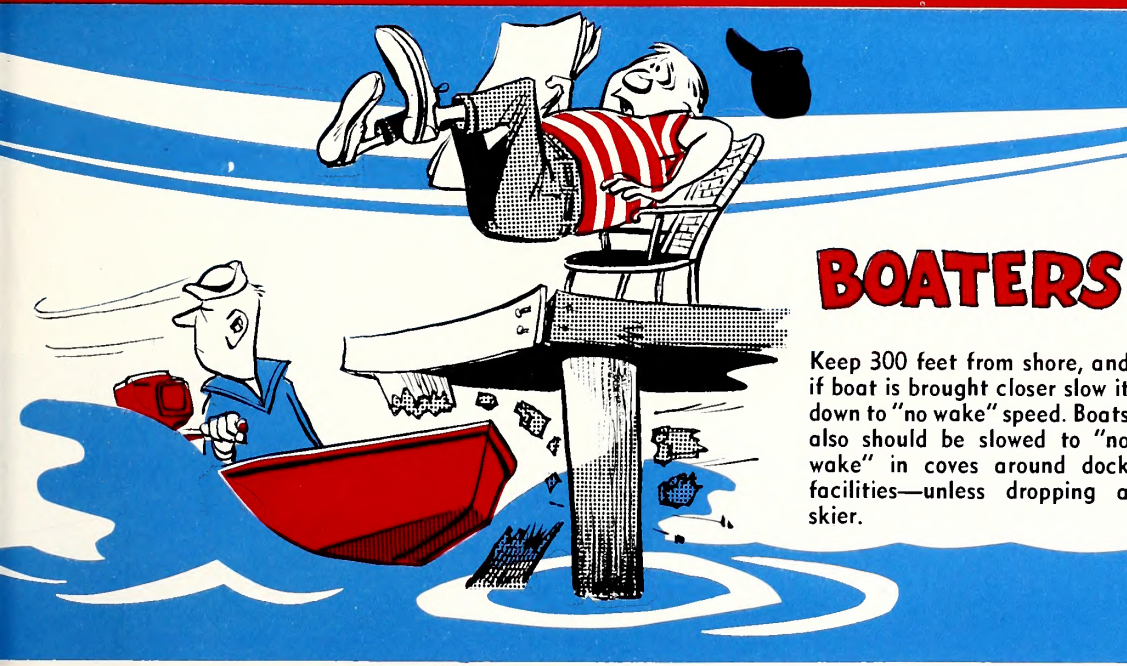
Although this photo is actually of the Roanoke River, it shows the type of water to be expected in the Dan River. Water levels will change from day to day, and river conditions influence the quality of the striper fishing.

JACK DERMID

WATER SAFETY RULES

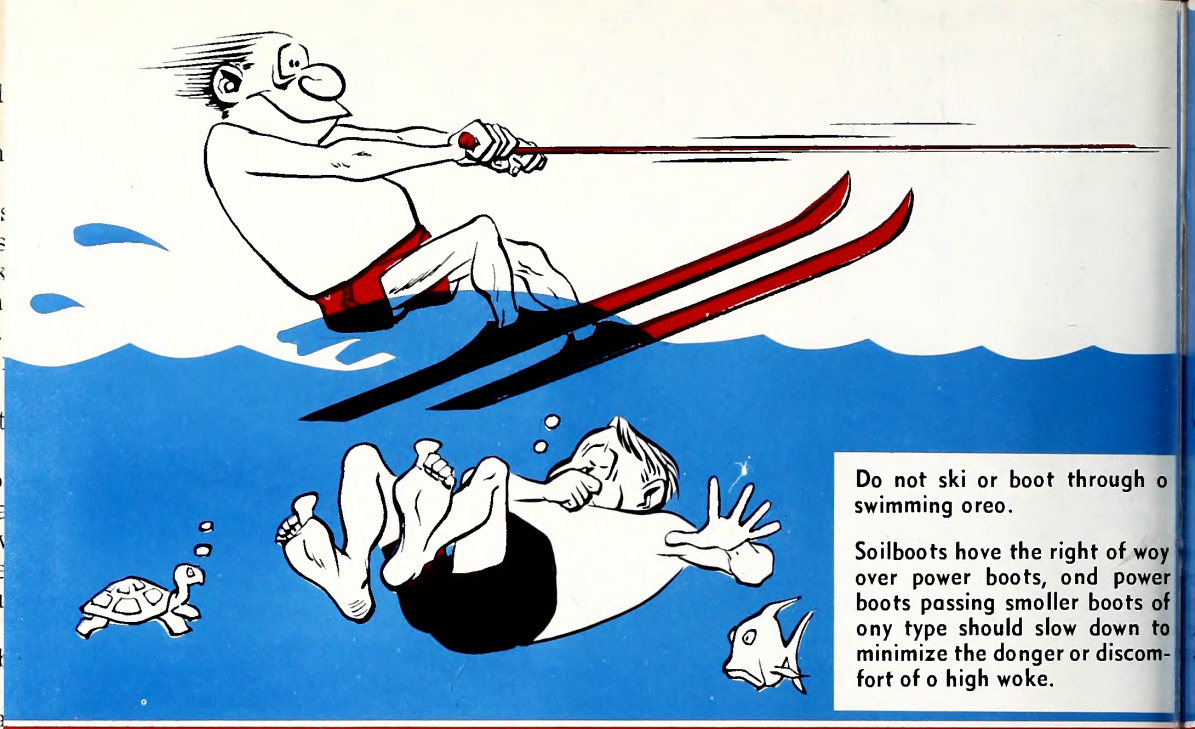
SWIMMERS

Do not swim across channels. If possible, designate swimming areas with floats or markers, and stay within these.



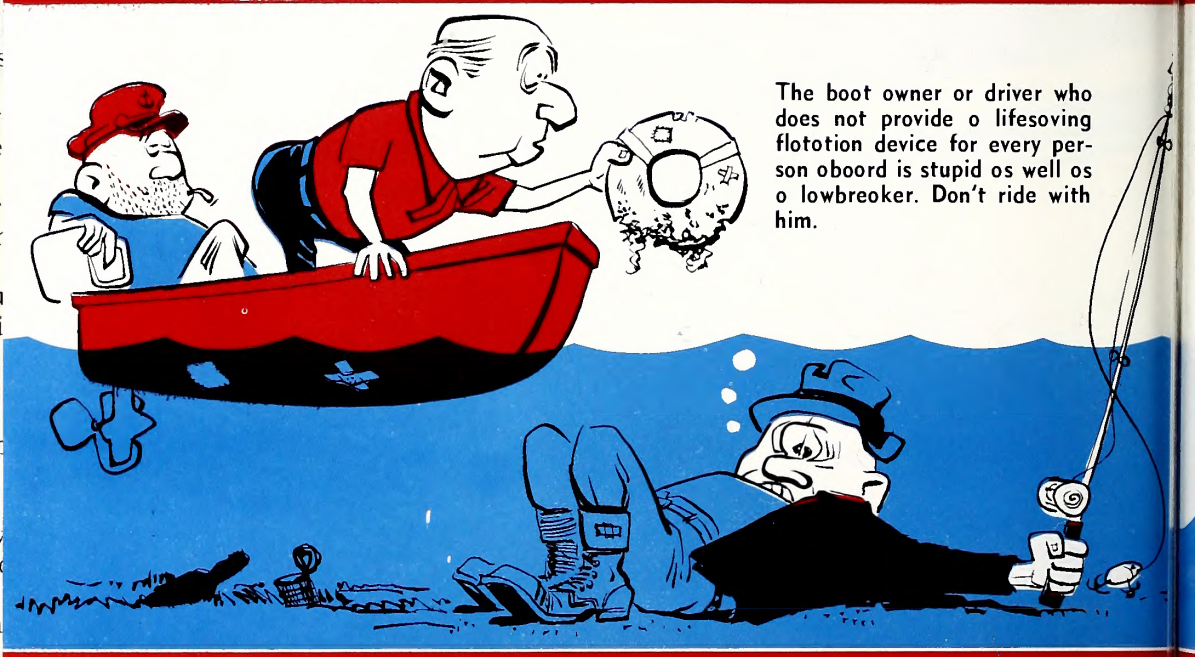
BOATERS

Keep 300 feet from shore, and if boat is brought closer slow it down to "no wake" speed. Boats also should be slowed to "no wake" in coves around dock facilities—unless dropping a skier.



Do not ski or boot through o swimming oreo.

Soilboots hove the right of woy over power boots, ond power boots passing smoller boots of ony type should slow down to minimize the donger or discomfort of o high woke.



The boot owner or driver who does not provide o lifesoving flototion device for every person oboord is stupid os well os o lowbreoker. Don't ride with him.

DON'T OVERLOAD
Remember, seats do not indicate capacity.

DON'T STAND UP
If you must stand, or change seats, keep to the center with both hands on gunwales, keep low.

KEEP WATCH

For rocks, logs or other obstructions, as well as for other boats, swimmers and water skiers.

WATCH THE WEATHER

In rough water, keep low in the boat and head into the waves.

TIMES-NEWS, ED MCCAULEY

Coast Guard Auxiliary officers H. H. Thies and C. Colarusso award decal (insert) to boat as owner Dr. J. E. Roberts looks on.

How Safe Is Your Boat?

by Dorothy Reynolds

WHETHER you're a new boatman or a seasoned skipper, the CME day of the Coast Guard Auxiliary is important to you. CME? Courtesy Motorboat Examination, and April 30, 1966, has been designated CME day for this year, and as a public service, trained inspectors will make a check of safety and legal requirements on pleasure craft.

Boats that qualify are awarded the Coast Guard Auxiliary decal. The Coast Guard of the United States as well as most state authorities recognize this decal as signifying that the vessel meets the requirements for boating safety.

This courtesy inspection is free and made only upon the request of the boat owner. Deficiencies are not reported, but the owners are made aware of the hazards of unseaworthy boats and inadequate equipment. The examination will be given at specified places at many of the lakes and marinas of North Carolina. In addition, factory built stock outboard boats may be inspected on a trailer rather than in the water.

In addition to legal requirements such as life saving devices, lights, sound producing devices, fire extinguishers, and proper ventilation (all dependent on boat size), each boat must meet certain other standards considered by the Coast Guard and the Coast Guard Auxiliary as essential to safe boat operation. The following equipment must be on board before a decal may be awarded: (1) distress flare, (2) one paddle or oar, (3) anchor and line suitable to the locality, and (4) at least one adequate manual pump or bailer.

Auxiliary examiners will not award a decal to a vessel which, in the opinion of the examiner, is not in good over-all condition. Fuel lines should be intact and preferably lead from the top of the fuel tanks. Tanks with capacities of more than seven gallons must be permanently installed, with a filling arrangement outside the cockpit, and vented outboard. Many factors contribute to a vessel's seaworthiness and each vessel with a decal must be generally shipshape.

Promotion of boating safety is the over-all purpose of the Coast Guard Auxiliary in its Courtesy Examination program. In North Carolina last year, 63 deaths occurred due to lack of knowledge on safe boating, the lack of safety equipment, etc. A way to be *sure* is offered each boat owner; watch the local papers, listen to the radio or television station nearby to learn the exact location and hours of operation of the Coast Guard Auxiliary CME station in your area. Keep a date with the local Auxiliary inspection team on CME Day, April 30, 1966. The life you save may be your own.

Spring Song

Photos by
Joel Arrington
and
Jack Dermid
Text by
Bill Palmer

WITH the advent of warm spring rains many species of amphibians have ventured forth from hibernation for the purpose of breeding and perpetuating their species. Often these breeding aggregations comprise many individuals. The secretive and voiceless salamanders usually remain unnoticed by all but the experienced observer, but the toads and frogs give vent to their amorous intentions with penetrating songs, drifting up from flooded portions of the countryside and resounding through the night.

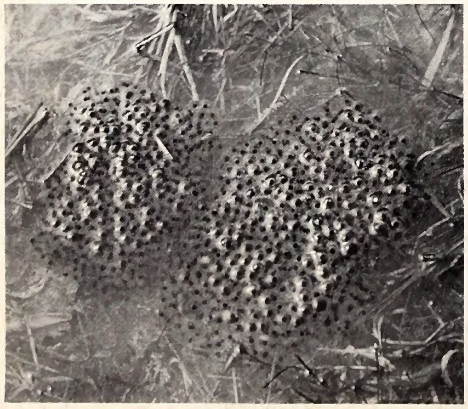
Several species are "explosive" breeders and may breed during heavy rains several times each year. Generally the males are first to arrive at suitable sites where their songs serve to guide potential mates to the area. With some experience one can learn to identify the different species by their characteristic voices.

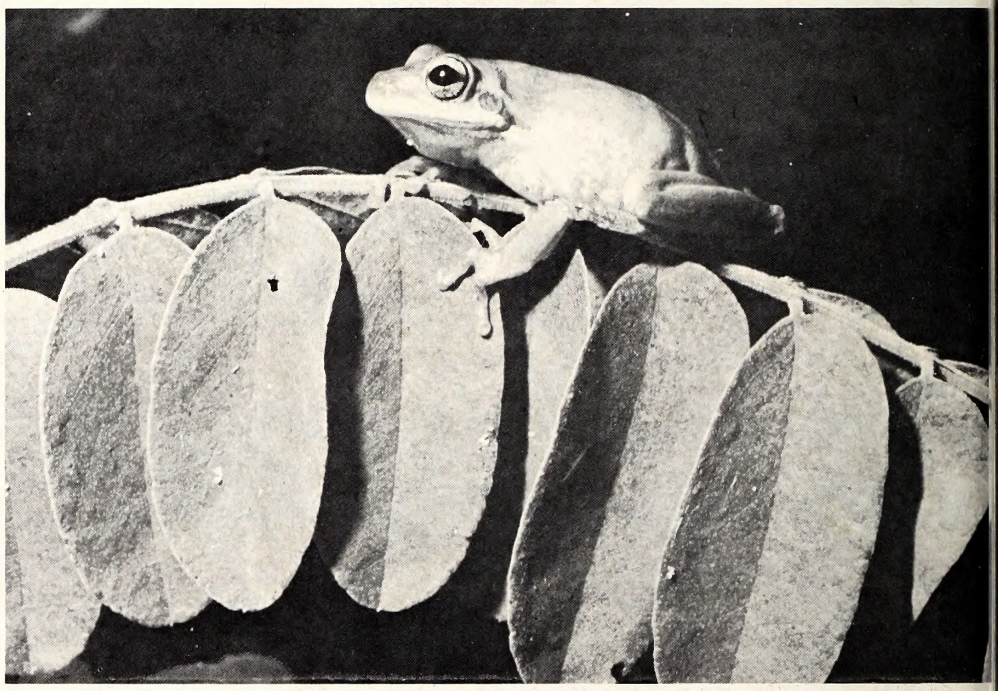
Toads and frogs are among our most beneficial animals since most feed almost exclusively upon insects.

FOWLER'S TOAD is adept at bug catching.

TOAD EGGS are laid in gelatinous strings.

FROG EGGS are deposited in masses.





SQUIRREL TREEFROG. A colorful little frog which is most commonly found in the Coastal Plain. Its call often sounds like that of a squirrel. GRAY TREEFROG (below) This species is among the most abundant of the treefrogs and occurs throughout the State. The male is shown with vocal pouch inflated, its song filling the night air.

AMERICAN TOAD. The largest toad in the State, this insect catcher's call is a pleasing musical trill of evening.

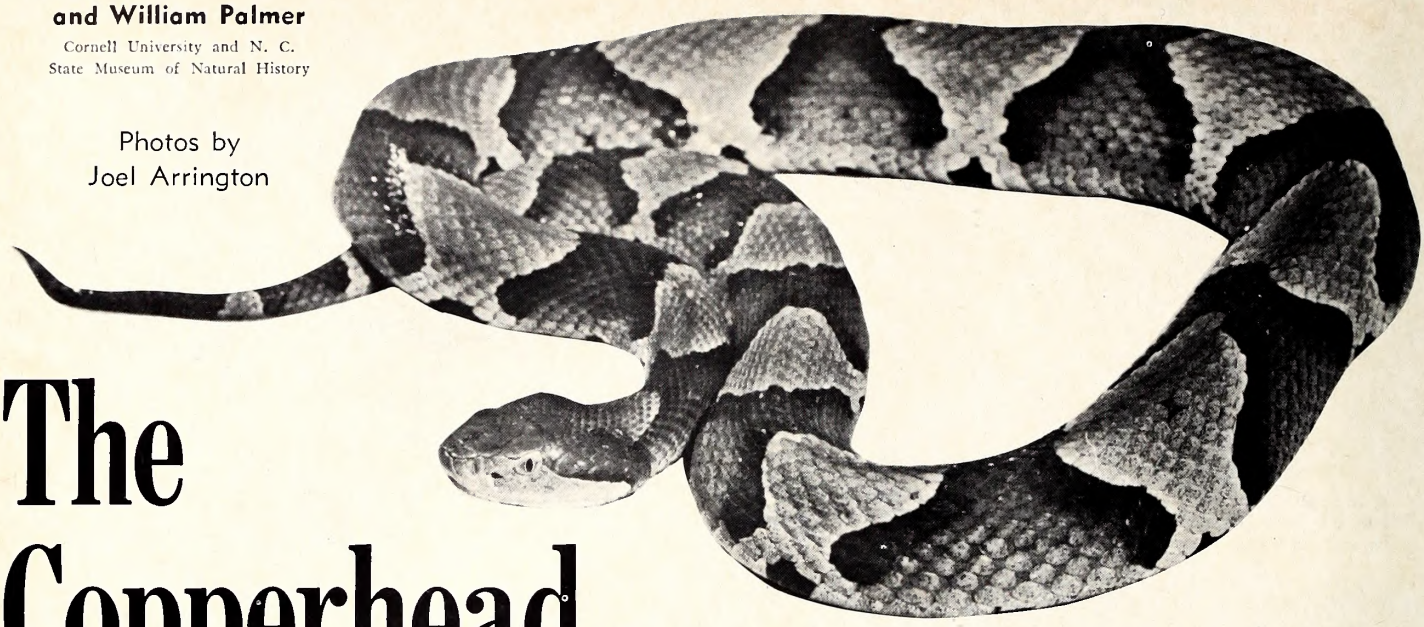
SPRING PEEPER. One of the first frogs heard in early spring, its series of loud peeps beginning with the first warm nights.

LEOPARD FROG. (below) Commonly called "grass frog", this colorful species is very abundant in aquatic areas statewide.

BULLFROG. The basso profundo of the frog world, he is widely known for his edible qualities and booming voice. **PINE BARRENS TREEFROG.** (below) Among the most beautiful of all our species, they are often heard in the Coastal Plain bays.

by Franklin F. Snelson, Jr.
and William Palmer
Cornell University and N. C.
State Museum of Natural History

Photos by
Joel Arrington



The Copperhead

A SPECIES with as many vernacular names as color and pattern variations, the copperhead, *Agkistrodon contortrix,* is known in different sections of the State as highland moccasin, pilot, poplar-leaf, white oak, and red oak. In some coastal areas it is frequently confused with the very colorful and inoffensive corn snake. However, copperheads may be readily distinguished from all superficially similar species by the moderately stout body, the presence of a pit between and slightly below the eye and the nostril, a single row of scales on the underside of the tail, and the characteristic dark crossbands across the back and down the sides.

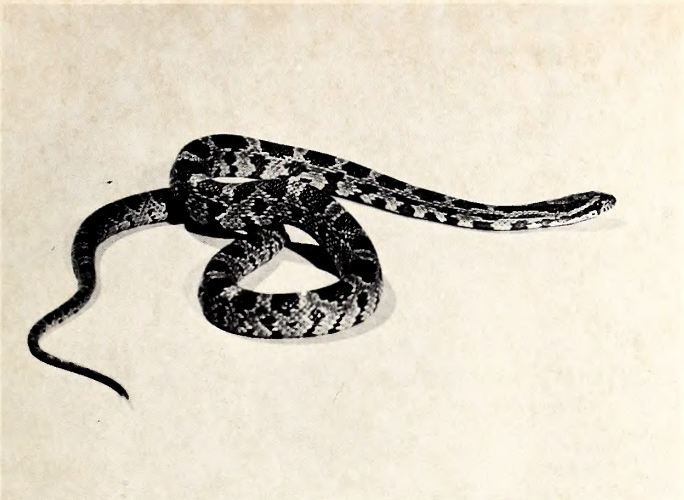
These bands are constricted and narrow along the middle of the back and when viewed from above resemble a series of hourglasses; when seen from the side they appear as inverted Y's. Often some may be broken and thus fail to connect their opposite counterparts. General background coloration may vary from dark chestnut brown to pinkish, but usually with the dark crossbands in marked contrast with the background color. The copperhead is a medium-sized species and most adults measure less than a yard. The largest individual among over 100 specimens in the State Museum measures slightly less than 4 feet.

In eastern United States this common species is represented by two sub-species, both of which are reputed to occur in North Carolina. However, interbreeding between the two races is frequent, especially in the Coastal Plain and lower Piedmont. The range of the species east of the Mississippi River extends as far north as southern and southwestern Illinois, the southern portions of Indiana and Ohio, and east to southeastern New York and Massachusetts. The southern distribution reaches the Florida panhandle and west to the eastern portions of Texas, Oklahoma, and Kansas. Copperheads have been recorded from every county in North Carolina and are considered to be our most common venomous species.

Preferred habitats are varied and range from lowland swamp and pocosin in the lower Coastal Plain through mixed pine and hardwoods in the Piedmont to rocky hillsides up at least 3000 feet elevation in the Mountains. In the spring and fall specimens often are discovered beneath scrap tin, loose stones, boards, and similar cover about grain storage structures and partially dismantled houses. We recall a particular wood lot in Craven County, less than 100 yards from the owner's home, where five copperheads were collected under such debris after 20 minutes of searching. Subsequent visits to this locality during the spring and fall have almost always produced at least one specimen. With the arrival of summer this species is most often encountered in damp bottomlands, and during this time of the year becomes nocturnal.

Probably 90 per cent of all venomous snake bites in North Carolina may be attributed to copperheads. Fortunately the bite of this species is seldom fatal; in fact, authentic accounts of human deaths caused from its bite are indeed rare. Although probably the least dangerous of our venomous snakes, a copperhead bite should never be underestimated. A large specimen is most dangerous, especially to small children, and is certainly capable of inflicting a serious if not fatal bite. As a general rule, however, most individuals are not aggressive and most accidents result from a person stepping on or trying to pick up a specimen.

It is wise for all persons moving about at night during the summer in areas known to be inhabited by copperheads to make use of a good flashlight and to



Although this corn snake is physically quite different from the copperhead, it is occasionally mistaken for the poisonous reptile because of a vaguely similar color pattern.

This is the northern water snake, non-poisonous, but again sometimes confused with the copperhead. When in doubt of a snake's identity, it is always best to leave it alone.

watch where he steps. Actually less caution need be employed to avoid snake bite than one would unconsciously use in walking along sidewalks or crossing streets in the city. If given the opportunity most snakes, harmless and venomous alike, will put as much distance as possible between themselves and a human adversary.

Were it not for their venomous nature copperheads might be considered as among our most beneficial species. Those found in numbers about barns and abandoned houses probably are attracted to such sites by an abundance of mice and other injurious small rodents. The food varies, however, and the diet is supplemented by frogs, insects, and occasionally birds and small snakes. Prey is first bitten and consumed shortly following death by venom injection.

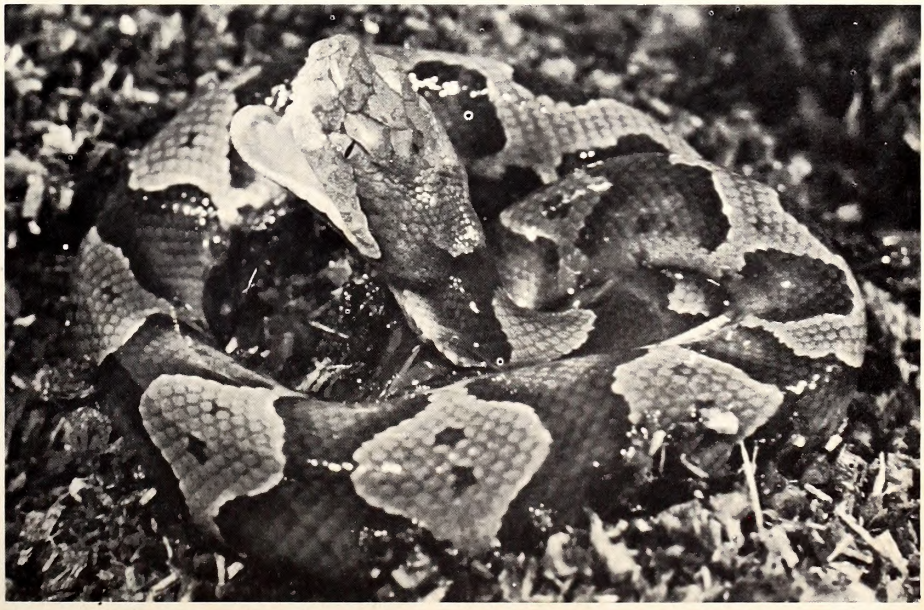
Breeding usually occurs in the spring and 3 to 12 young, each about six inches in length, are born alive in the late summer or early fall. As is the case with all venomous snakes, these juveniles at birth are well equipped with fangs and functional venom apparatus.

Copperheads can become a potential menace about human habitations and recreation areas and it probably is wise to kill them on sight in these sections. One of the best methods to discourage the presence of snakes about dwellings is to remove all possible hiding places (wood piles, scrap lumber, pieces of tin, etc.) and to check periodically and again remove all accumulated debris that might possibly serve as shelter for the animals.

It is unfortunate that many young reptile fanciers sooner or later feel that they should keep venomous snakes in captivity. Such action is to be strongly discouraged. There are too many harmless species from which much can be learned by observing them under captive conditions, not to mention the ever possible and actually probable chance of being bitten. Almost all persons who collect and handle venomous snakes for any length of time are eventually bitten, and snake bite can be and often is a serious and extremely painful experience.

The proper places for venomous snakes are on a shelf in the research collection of a museum, properly preserved, labeled, and catalogued for use in scientific studies; or alive inside well-constructed, locked cages of a zoological garden or laboratory where they are subjects for education and legitimate research. Nevertheless these usually despised creatures do occupy a major niche in those few remaining and now rapidly disappearing wilderness areas. Perhaps we should leave them here for as long as possible. ♦

This newly-arrived baby copperhead is well equipped with potent venom and functional fangs. The markings are about the same as an adult snake, but perhaps more vivid in color.



Conducted by John Parker

LIFE saving devices could mean the difference between life and death in dozens of boating mishaps in North Carolina each year. And because the proper device is not aboard or is not properly used, drowning continues to be the cause of death in over 90 percent of the boating accidents in this state.

Too often life saving devices are sat upon, used for boat fenders, stored in hard to reach places, left home, allowed to deteriorate, or depended on way beyond the replacement point. Such occurrences certainly do not help reduce drowning deaths. Boating accident reports are filled with stories of victims and life saving devices. Most of the stories have one basic likeness, the life saving device was found in one place, and the victim in another.

Conversely, reports turn up where the victim was wearing a life preserver. For the most part, in North Carolina, this type of accident takes place in the winter or spring when the water temperature is in the 30's and 40's. Death is usually from exposure, shock or drowning as a result of being incapacitated by the cold.

We have no real answer for this most perplexing problem. This is why we have said previously in this column that extreme caution must be exercised during the cold months. The first boating accident for 1966 involved three deaths attributable mainly to the water temperature.

This problem has been dealt with at some length by the armed services and other agencies. Pilots flying over cold waters often wear special exposure suits which are similar to SCUBA diving wet suits. The Coast Guard has tested the wet suit in cold water and discovered that this insulation retains much of the body's heat that would otherwise be carried away by surrounding water. Such "clothing" may not be practical for the cold weather pleasure boater, but neither is death by shock or exposure.

There are reasons other than numbness from cold that could cause the man overboard to be completely dependent upon a life saving device. Panic, severe injury or unconsciousness due to a blow on the head are a few such reasons.

If you do find yourself in a situation where you are completely dependent upon a life saving device, which one might let you down? Certainly the one you should be wearing but aren't will let you down; the ski belt (not approved) will really let you down—face down that is. The cushion (approved for Classes A, 1 and 2) will be of little value to the unconscious or incapacitated person; certain other special purpose devices such as ski vests or buoyant jackets may not withstand the acid test. And in some cases, the approved preserver may not do the job. Yes, the latter deserves qualification.

Approved preservers that have been damaged, or that are worn incorrectly may let you down, too. Extremely rough water or your own physique may cause the device to float you just a trifle low in the water. Under safe test conditions, give yours a try. In other words, get to know your life saving equipment.

To the conscious, alert individual who can swim at least a little, cushions, jump vests and even ski belts are better than nothing! But the final outcome may depend on how long you can stay alert and strong and how long you must remain in the water.

A good life saving device must do more than simply support your weight in water; it must keep your face well above water when in situations like those described above. So—you can stay within the law with any one of several devices, but will you stay alive in an emergency?

The first rule of purchase when buying new equipment is to make sure it is Coast Guard approved. Remembering if it is, then it will be acceptable to state officials as well as Coast Guard boarding officers. The Wildlife Resources Commission adopts Coast Guard approval standards. Another important question concerns the type of craft it is to be used on. Most devices found in sport shops are for use on boats up to 40 feet (Classes A, 1 and 2). You may have to shop a little for the life preserver that is approved for the larger craft.

Who is it intended for, child or adult? Check the size; this information, too, is on the approval label. Remember you don't have to buy the first one you pick up. Shop for a life preserver as you would a suit of clothes. Ask yourself if *you* can fasten the straps, etc., under emergency conditions.

Life Saving Device Terminology

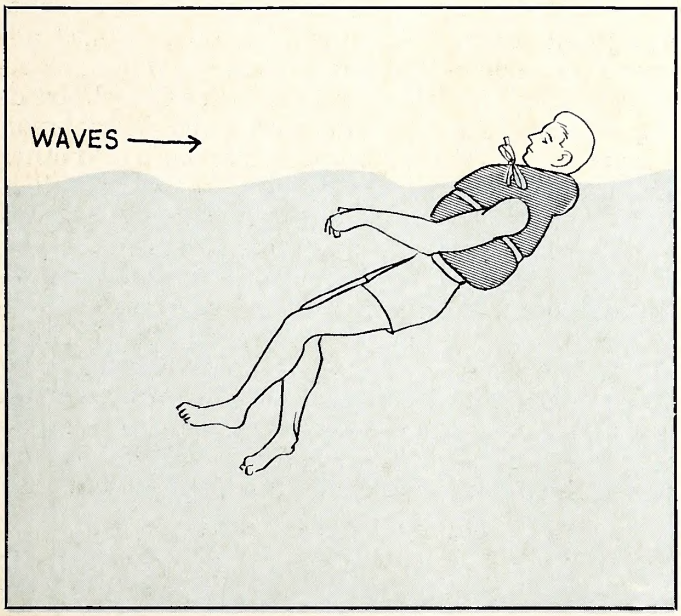
The term life saving device encompasses life preservers, buoyant vests, buoyant cushions, ring life buoys, horse shoe life rings and special purpose water safety buoyant devices such as hunter's buoyant coats and ski vests (a few of the latter two types have been approved). Do not confuse ski vests with ski belts. Ski belts will never be approved because an unconscious wearer would be floated face down. Any of the above devices, if U. S. Coast Guard approved, are acceptable on motorboats less than 40 feet in length (includes Class A, 1 and 2) not carrying passengers for hire. Class 3 motorboats (40 to not more than 65 feet), not carrying passengers for hire can only carry life preservers or ring life buoys. Motorboats of any length carrying passengers for hire must carry one adult life preserver for each person aboard and

a number of preservers suitable for children equal to at least ten percent of the number of people aboard. Motor vessels, boats over 65 feet, have slightly different requirements but are basically required one adult preserver for each person aboard.

Life saving device terminology can be confusing. The terms ring buoy, bouyant cushions, etc., are self-explanatory. But the terms buoyant vest, life jacket, and life preserver are often confused.

The basic difference between a vest and a preserver is the amount of buoyancy that the device offers. The preserver offers more buoyancy. And while either may be designed to be worn like a horse collar, only preservers come in a design worn like a jacket. Therefore, the term life jacket is superfluous. It actually describes style as opposed to type.

Buoyancy, or the ability of something to float, is the key factor in life saving device construction. Buoyancy is determined by the weight of iron a device will sustain in fresh water. The human body, we are told, "weighs" two to twelve pounds in water. The exact weight would depend on the type of water and the individual. From this it would seem that a life preserver offering 12 pounds of buoyancy would suffice. However, we must not lose sight of the importance of keeping the face



This sketch shows the correct position, floating in the water with a Coast Guard-approved kapok life preserver properly worn. Note the head is barely out of water; don't expect more.

high and dry. Therefore, the device must offer enough reserve flotation to ride the victim higher out of the water. There must be more buoyancy.

Minimum Coast Guard buoyancy requirements are as follows: life preserver buoyancy varies from 25 pounds for the adult kapok or fibrous glass type (16½ for child size) to 16½ for adult cork or balsa wood (11 pounds for child size). Unicellular plastic foam preservers require 22 pounds of buoyancy for the adult, 11 pounds for the child size.

Buoyant vest requirements are: adult — 16 pounds, medium child—11 pounds, small child—7½ pounds for kapok or fibrous glass. Unicellular plastic or unicellular polyethylene foam vest require 15½ pounds for adult, 11 pounds for medium child and 7 pounds for small child.

Buoyant cushions require 20 pounds for kapok, fibrous glass or unicellular plastic.

Ring life buoys, either cork, balsa or unicellular plastic, require 16½ pounds for the 20-24 inch model and 32 pounds for the 30 inch model. Ring buoys are not made of kapok or fibrous glass.

Special purpose devices such as approved ski vest require 15½ pounds for adult, 11 pounds for medium child, and for a small child 7 pounds.

Approval Tag

Information concerning Coast Guard approval, which we have mentioned, is found on the approval tag or label. There are several pieces of information on this tag. The buoyant vest tag, for example, carries: type, the wording, "buoyant vest", model number, adult or child size, what craft it is approved for (Class A, 1 and 2 or boats up to 40 feet not carrying passengers for hire for vest), U. S. Coast Guard approval number (160.047 for kapok vest), instructions for care, name and address of manufacturer, and weight range for child size.

Never remove the approval tag. In caring for the device, remember to care for the tag.

Buoyant cushion tags must carry such information as "Do Not Wear On Back," size of device in inches, etc.

Special purpose devices will have combination "Laboratory/USCG" labels. This means the Coast Guard is authorizing certain nonprofit laboratories to evaluate the device. To date the Yacht Safety Bureau, Inc., has been authorized.

Care and Storage

- Stow where readily accessible in time of emergency (under a pile of other equipment, down in the bilge or under the foredeck would *not* be considered readily accessible.)
- Preservers and vests are not intended to be used as seat cushions.
- Dry before stowing to help prevent mildew. Stow in dry, well-ventilated place.
- Don't allow gasoline or oil to come in contact with device or otherwise soil cloth covering or straps.
- Stow away from excessive heat.
- Do not allow the plastic envelopes surrounding kapok and fibrous glass flotation material to become punctured.
- Replace broken snaps, D-rings or missing straps. Minor repair is permitted in cloth covering, for example, so long as repair approaches original and device is not weakened or misshapen.
- Cushions may, because of the dual usage, become unserviceable rather rapidly. Check these frequently.

Other Facts

- The life preserver is considered to be the most important piece of boating safety equipment.
- Non-swimmers, young children, handicapped

• continued on page 27

NORTH CAROLINA WILDLIFE

RESOURCE-O-GRAM

A ROUNDUP OF THE LATEST WILDLIFE NEWS

Mountain Trout Season Opens April 2

7:00 a.m. is zero hour for the opening of the 1966 mountain trout season Saturday, April 2. Somewhere between 1,500 and 2,000 miles of trout streams have been stocked with brook, brown, and rainbow trout, and if weather is favorable, a record number of trout fishermen were expected to be on hand. Creel surveys and fishing pressure studies indicate that about 25 percent of the total mountain trout fishing energy is expended on the opening day, the rest spread over the remainder of the season.

Spring Gobbler Hunts Slated in Some Areas

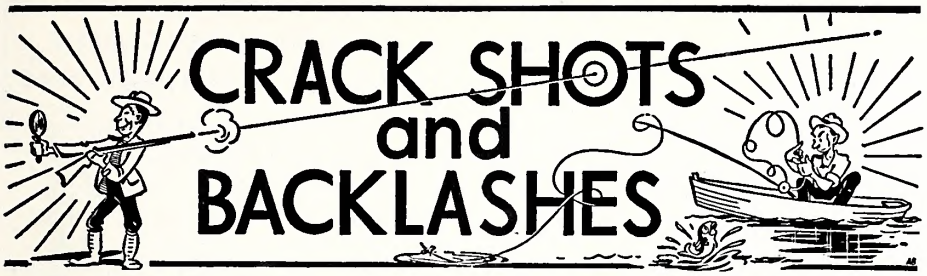
Four wildlife management areas in western N. C. will have spring turkey gobbler hunts this year. The Wildlife Resources Commission will conduct the hunts on the South Mountains, Standing Indian, Wayah Bald, and Santeetlah wildlife management areas on April 14, 15 and 16.

Daily hunting permits costing $4.00 will be available at checking stations on the management areas involved. Bag and possession limits will be the same as for fall turkey hunting, with one gobbler daily and two in possession. Persons who bagged their 2-per-season limit of turkeys during the fall and winter season will not be eligible to participate in the spring gobbler hunting, since the three-day, four-area hunts are part of the official 1965-1966 turkey hunting season.

Gun requirements for the spring gobbler hunts are: shotguns only, not larger than 10-gauge with No. 2 shot or smaller than 20-gauge and No. 6 shot.

Boat Registered? Fishing License Handy?

With the onset of the boating and fishing season, the Wildlife Commission urges boaters to be sure their boats are properly registered and equipped with proper safety devices; and anglers to be sure they have appropriate fishing licenses. Boat registration certificates are issued on a calendar basis, as are fishing licenses. Combination hunting-fishing licenses are valid from August 1, 1965 to July 31, 1966.



DEPARTMENT OF LETTERS TO THE EDITORS, FIELD NOTES, AND ITEMS OF INTEREST

Conducted By Rod Amundson

Although spring makes its official arrival in March, spring does not come into full bloom until April. Dogwoods make the woodlands look like late snow has fallen, flowers begin blooming, and early risers hear a symphony of birdsong.

Fish begin biting as if to make up for the long winter's fast, and backyard gardeners who turn up earthworms often yield to temptation and put aside the rake and hoe for fishing rod and tackle box. On warm evenings you hear bullfrogs currumphing in the pond.

Springtime is a time of awakening, of renewed life and vigor. While Man tills the soil wild creatures begin the age-old but ever new cycle of multiplying and replenishing the earth.

Spring Gobbler Hunts: Four wildlife management areas in western North Carolina will be open for spring gobbler hunts for the second year. The South Mountains, Standing Indian, Wayah Bald, and Santeetlah areas will be open to gobbler hunting April 14, 15, and 16, 1966. A $4.00 daily permit will be charged at the checking station. Bag limits are in accordance with daily and season statewide limits. Shotguns only may be used and are limited to not larger than 10 gauge and number 2 shot, nor smaller than 20 gauge and number 6 shot. Although none of these areas has large turkey populations, they have sufficient turkeys to provide some excellent sport for a number of hunters.

The Red Cross has announced the date of its annual small craft and aquatic schools. In this area there will be a small craft school at Clover, South Carolina, starting June 6. One aquatic school will be held in Hendersonville, North Carolina and another at Middleton, Tennessee. Both will start on June 6. A school is also scheduled in Florida, and August sessions are scheduled at part of the locations already mentioned.

These are 10-day schools and have an entry fee of about $60.00.

Wildlife in North Carolina recommends these schools and especially to those who will possibly be instructing in this field.

Check with a local Red Cross office for details on entry qualifications, attendance arrangements, etc.

Bluebird Time Again!

DEAR SIRS: We have been receiving "Wildlife" magazine for some time, and find it most interesting. My most interesting subject is "Bluebirds."

We got instructions for building bluebird houses, and built six. Two of these, we placed near the house, where I can watch them a lot. This was in 1962. These houses have all been used and I believe by bluebirds. They raise two broods each summer and usually four to the brood. It's amazing how many insects they catch. I've seen them flying in the air in the late afternoon, catching insects as they fly, to feed their young.

I always had the impression that the bluebird went south in winter. These around here don't. Every pretty day I see them visiting their houses. Last winter, in February or early March one of our coldest days, I saw the bluebirds coming to one of the houses, they would go in and out. When it got almost dark they went in (there were five of them) and stayed. To be sure they were in there, I investigated after dark to see when they would come out. Around 8 o'clock they begin coming out. They would come out and go back, and out for several times then they flew away.

In March they visited the houses again. In April they began nesting, they both worked hard at this. In May the female lays her eggs and starts setting. During this time the male sits close by and sings, he sings more early in the morning and late in the afternoon. When the eggs hatch they both work very hard feeding the young, and they are soon ready to leave. I can always tell by the vigorous singing the parents do; so I start watching to see them leave the nest. They usually all get out in one day. One brood, two came out in the afternoon and the other two stayed in the nest until morning.

The parents hover close and sing and do some terrible scolding if there is any danger close by. They look after them until they can make it, then start working toward their second brood.

Keep up the good work of preserving our natural resources and our natural beauty that God has provided for us to enjoy. Thanks for a wonderful little magazine.

I live within 20 miles of the top of "The Smokey Mountain" and it gets pretty cold here. So far I've seen the bluebirds every day. They do not sing much in winter though. MRS. FRANK ALLISON, WHITTIER

Youth Outdoors

DEAR SIRS: I read with great interest the article in January issue of **Wildlife In North Carolina,** by Mr. Sheldon Coleman. I agree with him that youth needs the out-of-doors like they never have before. They are losing interest in life itself when they lose interest in the out-of-doors.

Please forward my letter to Mr. Coleman because I would like to hear more from him concerning ways and means of getting nature classes in all our school systems.

Thank you for reprinting the splendid article. D. C. THOMPSON, DIVISION DIRECTOR, DEPARTMENT OF RECREATION (City of Durham)

Welcomed Visitors

DEAR SIRS: Within the past month I put up a bird feeder, in which I placed sunflower seeds, cracked corn, and bread and suet. About two weeks ago a female evening grosbeak came to feed. The following day, a male and female grosbeak came to feed. This female had a band on her left leg. Today I counted at least 30 grosbeaks, male and female.

I had been accustomed to seeing the evening grosbeak in my native state of Michigan, and I was delighted and surprised to see so many of them in my backyard here in

KNOW YOUR PROTECTOR

Willard N. West, Jr.

Willard N. West, Jr., Stokes County Wildlife Portector, was born on March 25, 1942, in Johnston County. He is the son of Mr. and Mrs. Willard N. West, Sr. of Selma, North Carolina. Mr. West graduated from Selma High School and attended Atlantic Christian College. Prior to employment with the Wildlife Resources Commission, West was employed by the Smithfield Police Department.

West completed the Pre-service Training School for Wildlife Protectors at the Institute of Government in Chapel Hill in 1963. On July 1, 1964, he was assigned to Richmond County as a Protector Trainee. On July 1, 1965, he was transferred to Walnut Cove in Stokes County. Since his initial employment, he has completed one In-service Training School.

Mr. West is a member of National Rifle Association. He is married to the former Kaye Massey of Smithfield, North Carolina.

DIVISION ENFORCEMENT RECORD FOR JANUARY, 1966

HUNTING & FISHING	
Persons checked	7,735
Total prosecutions	520
Total convictions	489
Total cases not guilty	12
Total cases nol prossed	18
Total cases dismissed	1
Total fines collected	$5,315.25
Total costs collected	$4,480.30
BOATING	
Boats checked	91
Total prosecutions	10
Total convictions	10
Total cases not guilty	0
Total cases nol prossed	0
Total cases dismissed	0
Total fines collected	$10.00
Total costs collected	$75.50

All fines and any arrest or witness fees are paid into the school funds of the counties in which the violations occurred, and no part of the fines or costs collected are paid to the North Carolina Wildlife Resources Commission or its personnel.

North Carolina. Are the grosbeaks commonly seen in North Carolina, and is there any way in which the origin of the banded bird could be traced? OPAL L. MARTELLE, SMITHFIELD

The evening grosbeaks' migratory pattern and routes seem to have changed over the last 10 years to the extent that they

are fairly common over much of North Carolina during the winter and early spring months. However, they still are considered abundant here. Any bird bands should be returned to the U. S. Fish and Wildlife Service, Washington, D. C. along with capture data.—Ed.

Ouch!

DEAR SIRS: In your February issue of **Wildlife,** on the back cover you mentioned Wildlife with horns, and named deer, rhinoceros beetle, Rocky Mountain sheep, the horned owl and catfish.

You stated that the catfish family's horns are harmless sensory barbels used to detect food and vibrations, which is correct; but I think there are a lot of young fishermen that read your magazine that would believe that a catfish is harmless after reading that.

I think you should have warned everyone that even though the barbels are harmless, that there are sharp spikes on the breast on either side and on the back fins that can give you a painful injury. Also, that in some of the smaller species, these spines are even poisonous, and that a catfish should be handled with caution. KIRBY A. BLAKE, WHITEVILLE.

We stand corrected, and learned about catfish spines the hard way.—Ed.

Baiting

DEAR SIRS: I have been a regular subscriber to "Wildlife in North Carolina" for the past 30 years. I have kept all the back copies since 1936. I have assisted in many campaigns to place it in rural and urban homes.

I would like to congratulate you for the excellent job you are doing in editing the publication.

Here is a question many readers would like to know the answer. It has to do with feeding or baiting game (particularly deer). "Under what conditions is it legal to feed and hunt deer, adjoining Government Reservations?" It has been called to my attention that private hunt clubs are using car loads of apples, sweet potatoes, or corn to attract deer. As a free-lance reporter I have asked more than a dozen game protectors the question and have gotten nearly as many answers. Would you please clarify an answer to this question? J. W. WHITESIDE, JR., CHARLOTTE.

The law against baiting applies only to game birds.—Ed.

Too Sleepy?

Dear Sirs:

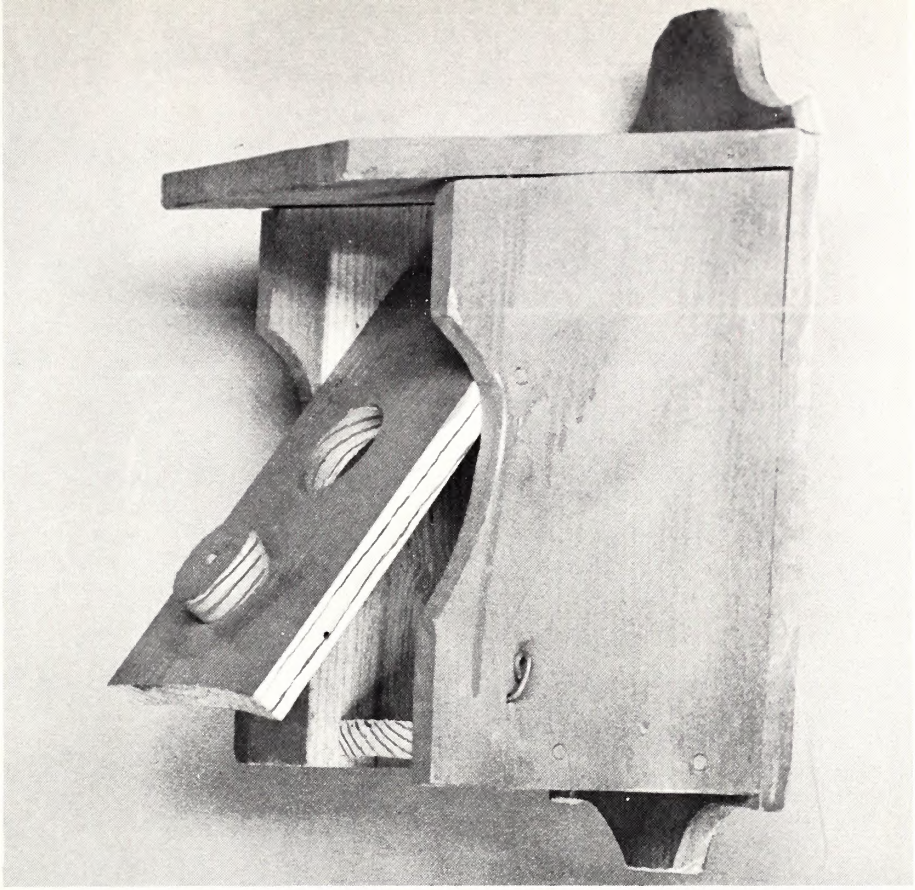
I really enjoyed reading WILDLIFE magazine and I hate to disagree with the artist's pictures, but I would like to correct one mistake that he made. His picture on the back cover of the January 1966, he had a man calling to report the men deer hunting at night. No offense, but he had the transmitter to his ear and the receiver to his mouth. All the telephones I have ever seen have been used the other way around. WILLIE COLLINS, MADISON

PS You might have done it on purpose, but I thought I would write you just for the fun of it. My father is the foreman for the Lee Telephone Company.

Smokey's Keeper

A Forest is a work of art, a place of God's Command,
So beautifully dressed and shaped as if arranged by hand,
The home of friendly helpless game so different from man,
Who don't possess the strength or skill to build upon the land,
And when I sit and watch a fire destroying all of these,
My heart pours out for helpless things and stumps that once were trees.
The birds all flee and leave their young to perish in the flame;
The raging fire unleashed roars on devouring other game.
If only man could share their fate and feel the sear of fire,
Be torn my brush, crushed by limbs and flounder through the mire,
And have to leave his loved ones there to suffer and to die,
To witness death and scortching flesh and hear them as they cry,
I'm sure before he struck a match he'd think and give some care
To what we read and hear so much, the pleas of Smokey the Bear.

BY: EVELYN BUTLER
NCFS FIRE TOWER
OPERATOR-HALIFAX CO.



Mr. Romulus Skaggs, 113 Circle Drive, Thomasville, N. C., sent us this bird house of his own design, and says it works well on most house-nesting song birds. He puts a unique hole size selector on it which he calls the "dial a wren". Try one.

SKIPPER

• continued from page 23

persons, etc. should wear a life preserver or buoyant vest while underway. All hands should don this equipment during adverse conditions.

• Do not carry substitutes such as inner tubes, complicated inflatable devices, children's floats, swimmer's aids, "war" surplus devices, etc. If however, for some strange reason you are caught without a life saving device, remember that empty or partly filled fuel tanks, water jugs, air trapped in a shirt, or even an oar may save a life.

• True life preservers must be orange in color. All devices should be purchased in this high visibility color.

• Have drills. Be sure your "crew" knows how to don a preserver quickly. The device should fit snugly, but not be binding.

• A good preserver or vest should turn you face up in a matter of seconds and keep your head well out of water and prevent it from tipping sideways.

• A good preserver will normally float you facing the direction of the wave action.

• Beware of devices that have a confusing number of snaps and fasteners. Such devices may be approved but are intended for use by highly trained, continually drilled individuals, such as in the Coast Guard or Navy.

• Remember you must have an approved device aboard for each skier being towed.

• Cork or balsa preservers are no longer approved or manufactured, but may be used until declared unserviceable. Kapok and fibrous glass filled devices not having plastic envelopes are no longer accepted by the Coast Guard.

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FRED S. BARKALOW

Nature's new arrivals include both plants and animals like these, a baby cottontail and ajuga.

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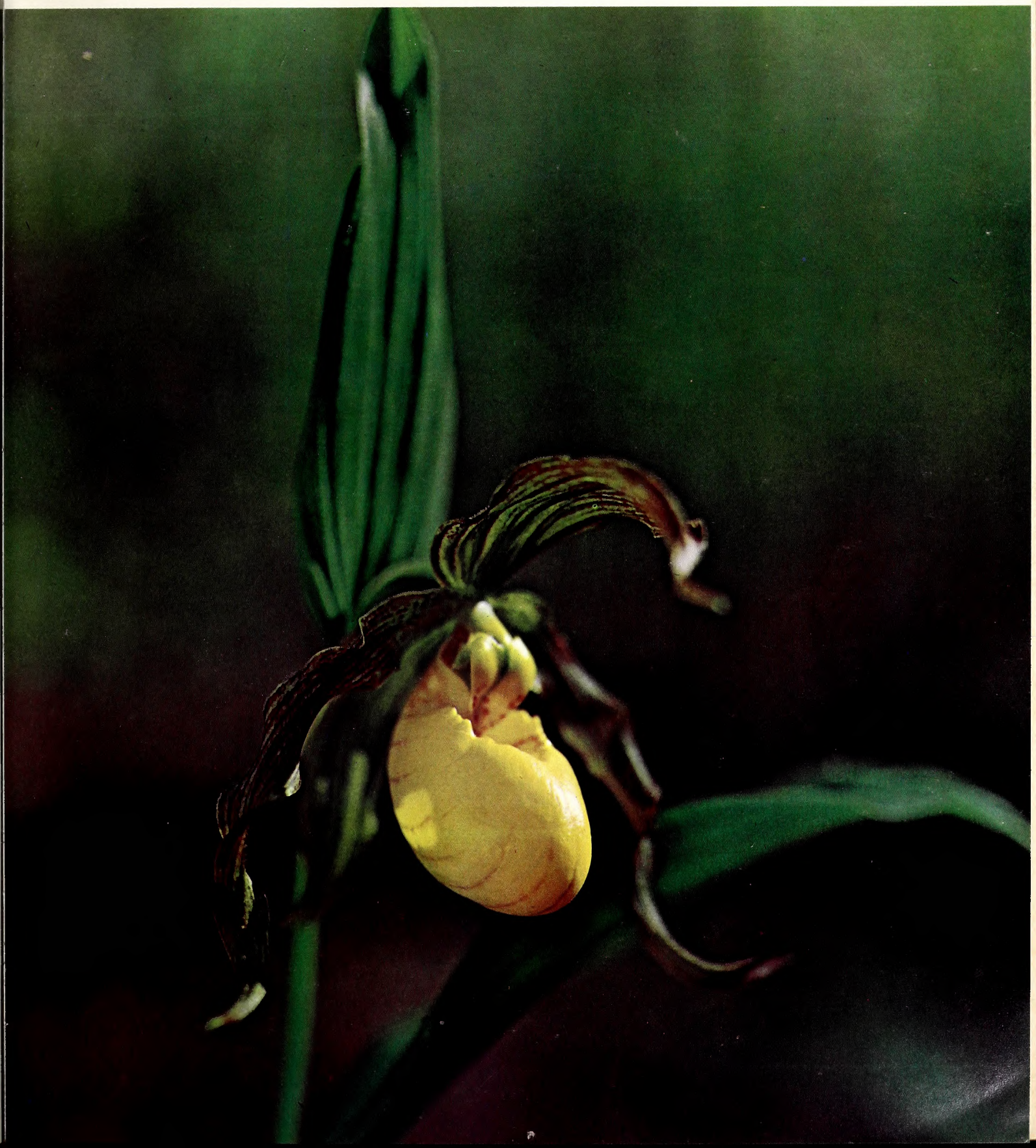
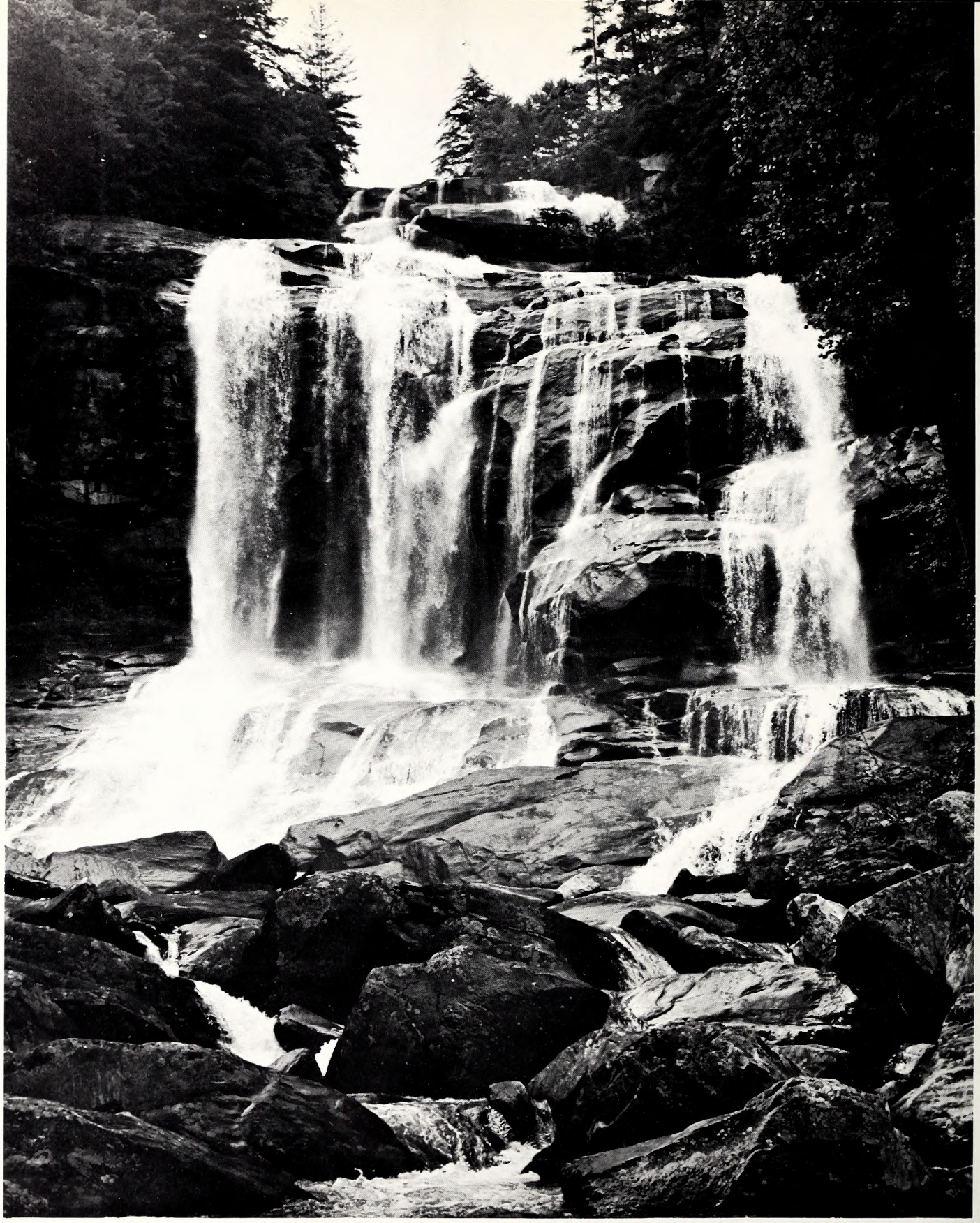
Wildlife IN NORTH CAROLINA

MAY, 1966





WHITEWATER FALLS, HIGHEST CASCADE IN EASTERN AMERICA
SOUTH OF CASHIERS, N. C. PHOTO BY JOHN PARKER, JR.

The outdoors deeply lies in American hearts,
In America's cherished traditions;
In its history, heritage, likewise its arts,
To preserve it should head our ambitions.

When Americans search for the meaning of life,
Or a means of escape from life's stress,
They won't find it in cities midst turmoil and strife,
But instead, in some lone wilderness.

Elliott S. Barker, Secretary
New Mexico Wildlife Association

STATE OF NORTH CAROLINA

DAN K. MOORE
GOVERNOR

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WILDLIFE IN NORTH CAROLINA recognizes the need for close cooperation between State and Federal conservation agencies and the people who hunt and fish—to bring about a restoration of our renewable resources. The Editor gratefully receives for publication news items, articles, and photographs dealing with the North Carolina out-of-doors, but reserves the right to reject materials submitted. Full credit is given for all materials published.

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MAY, 1966 VOL. XXX, NO. 5

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JOHN PARKER - - - - - OUTDOOR SAFETY

Orchids in North Carolina? Perhaps not the spectacular blooms of Hawaii, but certainly mighty pretty ones represented by the yellow lady's-slipper. This native member of the orchis family is scattered over the State where the ferns and beeches flourish. Its stately blossoms appear in May or June. It should never be picked nor the plant moved. Photo by Joel Arrington.

JACK DERMID

Either Sex Deer Hunts, 1965

by Grady L. Barnes
Supervisor, Eastern Wildlife Management Areas

The objective of North Carolina deer management is not necessarily "more deer." A substantial harvestable surplus of healthy deer, and a continued productive deer range are two prime targets of big game management. One way of hitting these targets is this:

"YOU cannot have any pigs if you kill your sows." This is a statement often encountered when you approach individuals in regard to the establishment of an either sex deer season. It is true if you kill *all* your sows you will not have any more offspring, but what is not considered is that if you never sell or kill any female pigs you will soon have more pigs than you have pasture or food to feed them.

This is essentially what happens when a deer herd increases to such proportions that an either sex deer season is necessary. The desired food which is palatable and readily sought by the deer is gone; that which contributes to the healthy conditions of the deer is gone and that which provides the calcium to grow the "trophy racks" is gone. At this stage of the game, the food provided by the deer's natural habitat has diminished to the point that the animal must look elsewhere, and this is where the conflict of interest between the farmer and deer is encountered.

During the summer and fall, deer are able to find sufficient herbs and other succulent growth to sustain their needs, but as winter approaches and the green vegetation disappears, they must rely on a good mast crop or an overbrowsed range. The deer that survive a hard winter are lean and hungry. When the farmer seeds an area adjacent to a wooded tract to crops such as soybeans, deer will move from the depleted forest range to feed on the succulent, nutritious beans as they emerge from the ground. And feed they do, as can be confirmed if you visit some farms in the eastern soybean growing sections.

What's To Be Done?

When this problem is encountered, there are usually three courses of action that can be taken: the farmer can lose his bean crop to the deer; he can shoot the deer doing the crop depredation; or he can request that an either sex deer season be established in his area.

All three courses have been taken in North Carolina. The drain to the economy of an individual farmer has ranged as high as a reported $5,000.00 loss in crops in one season. The number of deer killed in the act of doing crop depredation would cause many a deer hunter to have hallucinations, and would probably equal the 1,242 deer which were killed during the legal either sex season in 1965. In one eastern county where an either sex deer season was not opened due to local opposition, the wildlife protector estimated that 150 deer were killed doing crop depredation—probably more than would have been killed during a legal either sex season. Individuals killing deer in the act of doing crop depredation are not allowed to utilize the animal, but must call a Wildlife Commission employee and have the animal turned over to a charitable institution. The majority of these animals are killed during the hot summer days and often the meat spoils before it can be picked up, causing a loss to everyone. The third course, which I believe the most reasonable way to remove the surplus deer, is to establish an either sex deer season and allow the hunter to harvest them.

In 1957 the General Assembly granted the North Carolina Wildlife Resources Commission permission to establish either sex deer seasons in areas where a request had been initiated, but only under certain restrictive conditions. First, a trained wildlife biologist must conduct a survey of the area to check on certain factors which serve as indices to the level of the deer population. This survey usually includes factors such as prevalence of crop depredation, recognition of a harvestable surplus of female deer, overbrowsed forest range, and whether an either sex deer season would endanger the breeding stock.

Second, after the survey is submitted and approved by the Wildlife Resources Commission, a public hearing is conducted near the area for which the season is recommended and the choice is placed before the hunters and landowners; whether to lose

JOEL ARRINGTON

deer to crop depredation killing, parasites and associated diseases, and to have deer with small antler growth—or to reduce the total numer of deer (including females) and thereby maintain a healthier population with better antler development.

Facts Come First

What are some of the biological background facts that must be considered in establishing an either sex deer season? First, deer that are not overcrowed and that are in good physical condition will produce more offspring. An adult doe will normally produce twins, but if she is in poor physical condition, reproduction will drop to one or maybe none at all. Thus 100 healthy doe deer that are not overcrowded can produce as many fawns, if not more than 200 overcrowded doe deer. This differential in fawn production has been demonstrated on our areas under intensive management in North Carolina.

Another biological background factor is immunity to parasites. Normally, mortality from parasites is not a serious factor unless there are too many deer in a given area. When overcrowding exists, the more frequent contact between deer can result in a build-up of the deer's parasite burden. Also, a deer that is weakened in its struggle to obtain enough quality food is not capable of withstanding a heavy parasite load. This was the cause of the deer die-off last fall in one section along the Roanoke River in Bertie County; laboratory analysis of some of these deer revealed a heavy infestation of internal parasites. Field observations revealed a very high deer population and a shortage of food. The total mortality would have been larger had there not been a heavy acorn crop that allowed the deer to regain much of their lost weight. Many deer that would have been lost were salvaged through an either sex deer season and the residual population should consist of healthier animals.

A third biological fact is that the size of a deer and antler growth is dependent upon the proper food and nutrition; which, in turn, is closely related to the size of the deer herd and the condition of the habitat. Most of the very large deer with "rocking chair racks" are killed in areas where the deer population is low or in an area where deer have been recently introduced and there is little competition for food. Occasionally, a deer with impressive antlers is killed in an area with a high deer population. Usually this can be accounted for by the proximity and availability of farm crops. Bucks shed their antlers each year. The more nutritious the food, the healthier the deer, and the greater the antler growth. In areas of good habitat, a 1½ year-old deer can reach the four-to six-point stage and a 2½-year old deer can have a large eight-point rack.

Kill Figures

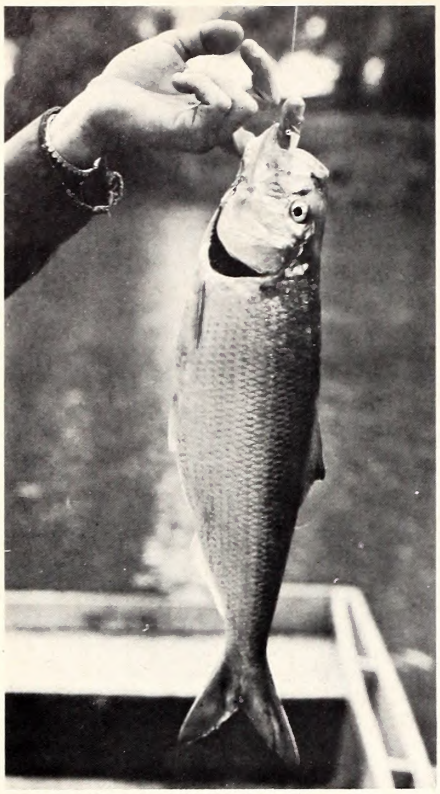
During the 1965 either sex seasons, a total of 1,242 antlerless deer were killed and tagged in 14 counties, excluding the kill on wildlife management areas. This represents only a fraction of the 38,000 buck deer killed annually in North Carolina. This total of 1,242 contained several bucks without visible antlers.

Length of either sex deer seasons ranged from 68 hunting days in one county to two days in several others. As shown in Table 1, the largest kill occurred in Bertie County where hunting pressure was intensified due to the deer die-off and where an effort was made to reduce the herd to a number which the range would support.

There are many other factors that play important roles in the establishment and control of deer herds in North Carolina. Research is constantly adding new information to the science of deer management. The facts given in this article are only some of the more basic and important ones. But equally important to the success of North Carolina's deer management program is the support and confidence of the hunting public.

TABLE 1. RESULTS OF EITHER SEX DEER HUNTS, 1965.

County	Season Dates	No. Of Hunting Days	Number Deer Killed
Bertie	Nov. 15-Jan. 1	42	
	Dec. 6-Dec. 18	12	406
Buncombe	Nov. 29-Dec. 25	24	113
Craven	Dec. 10-Dec. 11	2	18
Currituck	Dec. 6-Dec. 12	6	57
Gates	Dec. 1-Jan. 1	28	152
Halifax	Nov. 15-Jan. 1	42	
	Dec. 10-Dec. 11	2	199
Hendesron	Dec. 16-Dec. 18	3	17
Hertford	Oct. 15-Jan. 1	68	141
Madison	Dec. 17-Dec. 18	2	3
Martin	Dec. 10-Dec. 11	2	10
Northampton	Dec. 10-Dec. 11	2	108
Onslow	Dec. 10-Dec. 11	2	7
Perquimans	Dec. 10-Dec. 11	2	4
Wilkes	Dec. 13-Dec. 14	2	7
TOTAL			1,242



The spring target of many eastern North Carolina anglers is the white or American shad. Below, are two photos showing the preparation of the big seine which will be lowered into the lock for the population sampling procedure.

Photo Feature by Duane Raver

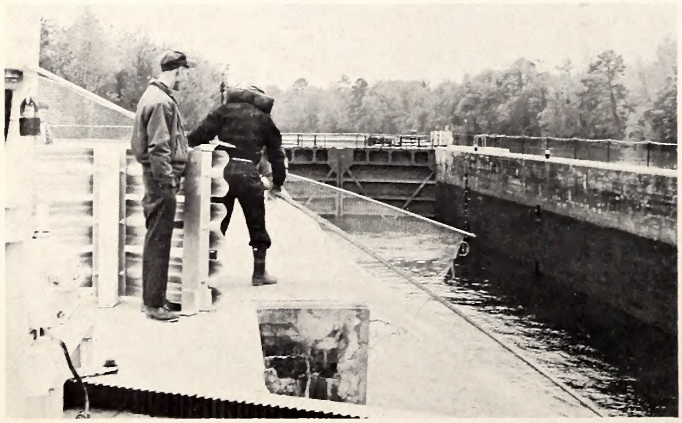
THE American shad, a thick-bodied, silver-plated, rough-and-tumble scrapper of the eastern seaboard, has been caught just about every conceivable way. The drift nets of the sounds, the pound nets of the estuaries, the bow nets of the lower rivers, seines, the gill nets, the glittering lures of anglers—all claim the shad in varying numbers from mid-March through June.

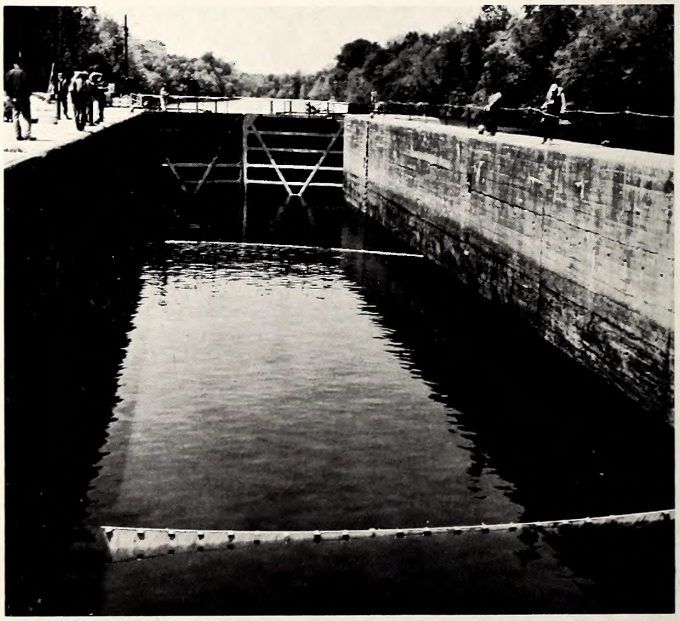
There is little question then, that the American shad is a popular fish, one way or the other, even though the fishery may be somewhat seasonal. But having our shad and eating them too, presents some problems to fishery managers.

For one thing, and a real important thing it is, what about the spawning grounds of the American shad? This salt water fish ascends the large rivers of the Atlantic Coast to spawn in early spring. One of these rivers, the Cape Fear, blocks the shad with several dams. Each of these dams has a companion lock, the canal-like structure which serves the barges and other boat traffic as an aquatic elevator and raises or lowers this commerce upstream or down, around the dams.

The dams are here, and here to stay. Fish, including the shad, simply can't get over them even though there may be a good bit of water pouring over at times. But what about the locks? Boats make the trips, why not fish? And from here was inaugurated a study of "locking" fish upstream during their spawning runs and thus foiling the obstructing dams. This study, which is a continuing venture, conducted by the U. S. Corps of Army Engineers, U. S. Fish and Wildlife Service and the Wildlife Resources Commission was described in two articles in *Wildlife in North Carolina,* November, 1962, and April, 1965.

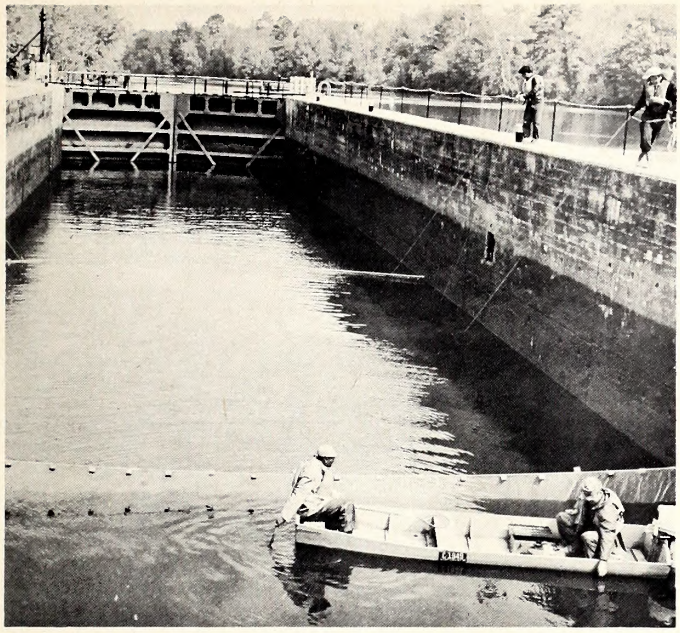
Some sort of measurement of the use that was being made of the locks by the fish had to be devised during this study. How do you count the fish that pass through these man-made structures? Several ideas were tried, some partially effective, others less successful. Then came the huge, modified seine whose use is picturd here. The photos tell the interesting story of ingenuity and another fishery management problem at least temporarily solved.





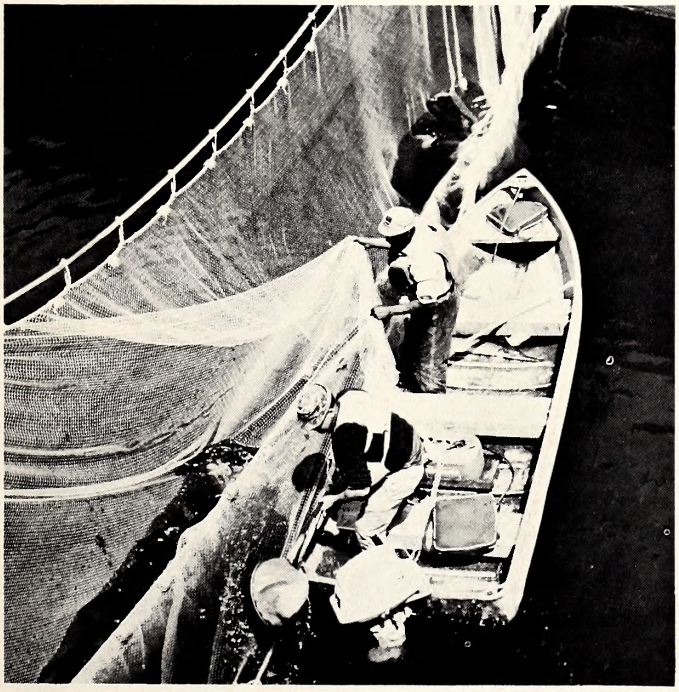
The king-sized seine is in the lock, slowly "pursing" the fish which have entered as the structure filled with water. They now have little means of escape, if all goes well.

OPERATION SHAD



As the ends meet, a boat checks the net for proper hanging. It takes a bit of patience to maintain the steady pace of the haul.

Another crucial moment as the net closes and is shortened into a bag for fish removal. Soon the fish will begin to jump.



Up they come for closer inspection. Dip nets are ready for whatever shows up. A nine-pound gar was in this haul. And the end result is better shad fishing for eastern North Carolina.

And here they are. Each fish is recorded as to species, approximate size, and then released. Some shad are tagged for study.

The Youngest Skipper

by William F. Melton, Sr.

Photos by the Author

CAP'N Billy, alias William F. Melton, Jr., of Charlotte, North Carolina, at the ripe age of ten is probably North Carolina's youngest skipper. Billy got a 12-foot Mirrowcraft as a Christmas present from his mom and dad when he was still only nine years old. Billy bought a six-horsepower motor with his savings and proceeded to get his boating lessons the pleasant way —through experience.

When in his father's opinion, Billy had learned the "rules of the road" and water safety, he was allowed to solo, but only in his own cove and well within eyesight of watchful parents. After he had demonstrated his ability in this, he was allowed to navigate for his dad to other parts of Lake Norman, to determine if he could handle the job of returning safely by himself, if allowed to visit friends, fish or run errands to other parts of the lake. After several months Bill seemed to have a chart of Lake Norman etched in his mind and Mr. and Mrs. Melton decided to let him go by himself to visit a friend four miles downstream. Without letting Billy know, they followed him—and Billy went straight as an arrow (a slow arrow) to the friend's cabin. From then on Cap'n Billy sailed his 12-footer without parental worry, and is now frequently asked to run over to Lakeside (five miles downstream) and pick up groceries.

With Lake Norman's irregular shoreline being the way it is, most distances are shorter by water than by road and Billy visits most of his friends by boat.

Cap'n Billy usually carries along a passenger whom he refers to as his "first mate", a two-year old German Shepherd named Tanka. The big, heavy coated dog loves the water and has been known to swim a distance of five miles following Billy. Tanka has been promoted from Apprentice Seaman to Admiral in Billy's Navy and reduced to Apprentice Seaman all in the same day.

When not piloting his own boat, Cap'n Billy spends his leisure time in the summer skiing or swimming. He can slalom ski expertly, has skied for 20 miles on double skis at one stretch and has completed the upper intermediate difficulty swimming course at the Johnston Memorial Y. M. C. A.

On October 12, Cap'n Billy traded his six for an 18 horsepower Evinrude and thus was confronted with North Carolina's motorboat registration law. That same day, he applied to the Wildlife Resources Commission for registration and on October 19, registration for the number NC 7129 J was issued. He is the youngest person ever to register a motorboat in this state.

Cap'n Billy, Tonka, and passenger Eddie Campbell, inspect a deep-water brush pile in Lake Norman (above left). Time to try'em, as Tonka moves starboard to trim the ship (left). And the young skipper produces! This is but one good catch (above) that has resulted from boating and fishing skill.

CONSERVATION IN ACTION

by Duane Raver

THE words written and spoken every year about the conservation of this country's natural resources would fill many a bushel basket. Yet not one of these words is worth the paper it's printed on or the time it takes to utter it unless they are followed up with some constructive action.

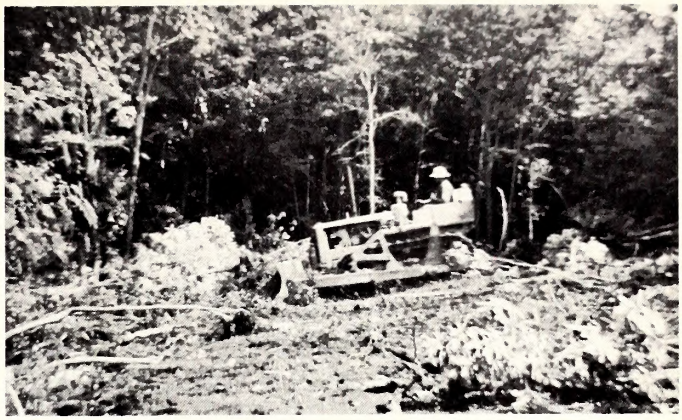
We are fortunate in North Carolina in having a small army of sportsmen who put words into results and really get out and work for better hunting and fishing. It may be a bit unfair to the thousands of dedicated outdoorsmen who toil at the often thankless job of conservation, to single out one group for commendation. But letting this group represent the countless others who also are pitching in with these big jobs of building a better outdoor North Carolina, let's look at a couple of things the Catawba County Wildlife Club is doing. Perhaps it will give your club an idea or two.

In the summer of 1965, the Catawba Club began looking for a "project", and in August settled on the Daniel Boone Wildlife Management Area for some on-the-spot action. With the cooperation of the Wildlife Resources Commission's Division of Game, a deer pasture project was begun. After careful planning, the improvement consisted of clearing an area of approximately 1½ acres and sowing it with rye and crimson clover. At the right time this spring, the area will be disked and sown permanently to fescue.

The big job was preparing the area for seeding. Some 20 shots of carefully spotted dynamite were used to clear stumps and rock formations. Then some 10 tons of rocks and roots were pushed, thrown or carried away—sometimes by hand. R. B. Hamilton was the "powder man" on the job, and was aided and assisted by Refuge Assistant A. Anthony and Refuge Manager Dewey McCall's two sons.

Removing the resulting rocks, trees and debris put plenty of kinks in previously unused muscles. Club members expended more than 300 man-hours of work on the project. Total cash outlay from the Club was $360, the major item of expense being 27½ hours of bulldozing. The club was high in praise of Dewey McCall and his boys, A. Anthony and Troy Moore, all of whom put in plenty of extra hours.

Even some of the Club members' wives got into the act by helping pitch out rocks and adding moral support on Sunday afternoons. It is believed that the Club saved the Wildlife Commission at least $800 even after taking in consideration the use of Commission equipment. Refuge Manager McCall says that this pasture was in the best condition of any ever put in on the Daniel Boone area. Only time will tell just how effective and lasting the results will be, but the Club deserves a "well done" for putting conservation into action.



Although willing hands provide a good bit of the power for the clearing project, a bulldozer was a big help here.

A continuing project of the Club is its scholarship program administered by the Catawba County Wildlife Foundation, Inc. This program is designed to aid deserving students in furthering their studies in conservation and wildlife management. The recipients are selected by the Board of Directors of the Foundation after careful consideration of candidates recommended by various academic leaders.

The first awards were presented to John Kent Crawford and Alan Lindsey Kyles, wildlife students at N. C. State University. Crawford, a North Wilkesboro native, and a sophmore majoring in wildlife biology, received a scholarship grant of $100 and a loan of $100 from the Foundation. Kyles, a graduate student majoring in animal ecology is from Troutman, North Carolina and received a scholarship grant of $200 and a loan of $300.

The Catawba County Club is not only assisting with conservation now, but is helping make sure that the future will have the technicians it needs continue the task.

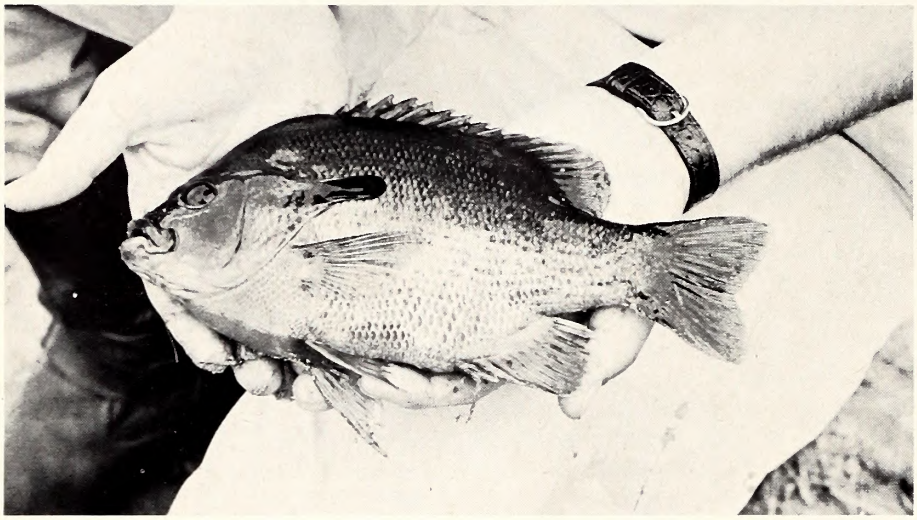
Left to right, Mr. R. B. Hamilton, Chairman of the Board of Directors, Catawba County Wildlife Foundation, Inc., presents award checks to Crawford and Kyles. Mr. Marten Keisler, a Director of the Foundation, assisted in making the awards.

Is It a Robin or a Robin?

HARBINGER OF SPRING

by Luther Partin

If you've been waiting to go fishing, wait no longer; the robin is here. This multicolored fish adds up to some fine sport, and here's how to catch him.



PHOTOS BY DUANE RAVER

LIKE their Yankee cousins to the north, thousands of people in eastern North Carolina are waiting for the robin's return to signal the advent of spring. However, the people to whom we refer are not the bird watchers, as a group, and this robin is an unusual kind of "bird"; in fact, it's a fish! Like the flying type of robin, this one also has red on the underside. In many eastern localities it is simply called "redbreast."

As its feathery namesake does for the citizenry above the Mason-Dixon line, the redbreast is a true harbinger of spring for the swarms of anglers who are apt to put up the mule or lock up the store when the word is out that the redbreast are biting. And the number caught during a good spring day can sometimes be fabulous.

Just as there are bream and bass specialists in other parts of the state, in the east you find redbreast specialists. They are just as dedicated, and sometimes more so, as other fishermen who find a particular species that appeals to them. Sometimes it's color and appearance. Then again it may be fighting ability or the aesthetic pleasure derived from the habitat the fish prefers. With the redbreast it seems to be a combination of all the above considerations, plus the fact that they taste good, too.

The colors and markings of the redbreast are very characteristic. Even the occasional angler should be able to identify this red-bellied scrapper, though many people often confuse it with the bluegill or the pumpkinseed. Two features should quickly separate it from any of its sunfish cousins—a long, black ear flap and several blue-green stripes between the mouth and eyes. The ear flap is much longer than the bluegill's and the stripes between the mouth and eye do not extend onto the cheeks as do those of the pumpkinseed.

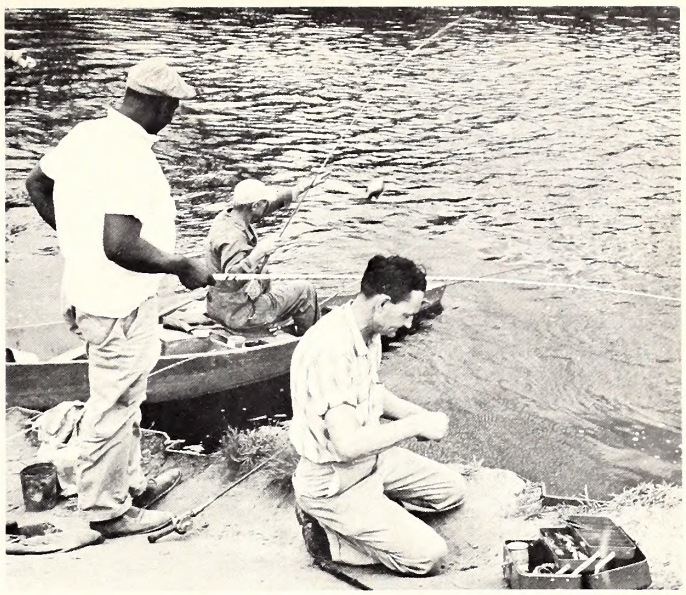
The robin's blocky shape contrasts with the oval shape of the bluegill and the humpback outline of the pumpkinseed. If you have any doubts after observing these features, remember the brightly colored underparts.

While the redbreast is usually considered the most important sunfish of the eastern warm-water streams, it may show up in a catch from a central-Piedmont stream. In such a case, it is often mistakenly called "brim," "yellow-belly," "speckle" or one of several other local names for unidentified sunfish with a red, orange or yellow coloration somewhere on the body.

THE highly-adapatable redbreast may be caught over a large part of the state, but not with the same certainty of abundance. Its range starts with the tidal creeks and goes to the mountains. But the preferred habitat is a clean, acid-stained, warm-water stream. This would mean that the black water streams of the Coastal Plains offer the best opportunity for anglers, and this is the case particularly in the watersheds of the Lumber, Cape Fear, and Northeast and Neuse Rivers.

As you might suspect, the redbreast is easier to catch when it is on its spawning run. In a normal year, spawning begins from early to mid-April and may last a month or more. This running-water fish may be found in large concentrations below dams or other obstacles to upstream movement during the spawning run. Carolina Power and Light Company's low dam on the Lumber River near Lumberton is a hotbed of fishing activity when this occurs.

Most any major tributary of the Lumber River should provide good fishing during the spawning run, particularly if you can locate some obstacle to upstream movement. This holds true even as far west as Richmond County on Drowning Creek. Others we have heard mentioned include South River, Big Marsh Swamp, and Big Swamp (Robeson County tributaries of the Lumber), Bell Swamp in the Waccamaw River Watershed and Town Creek above Highway 17 southwest of Wilmington.



Pick your spots for robin fishing. The water just below a low dam is an ideal place for the fish to congregate. Don't expect them to bite all the time though. You may want to wander on down stream, pull up your boat, and try the calmer water.

These areas, you will note, are in the south-central part of the state. There is good redbreast fishing to the east of this area, even as far east as Pamlico Sound. Goshen Swamp, located on a tributary of the Northeast Cape Fear River is quite a few miles north and east of the Lumber River, but still has good redbreast fishing.

A logical question about here would be, "How do you go about catching redbreast?" Ordinarily they respond well to a variety of small artificial lures such as spinners, spoons, and various other conglomerations of jewelry and hardware that are small enough. Natural bait, though, seems to be the choice offering when they are congregated for spawning. The cricket gets top billing by most people, but this doesn't rule out the earthworm. The big difference seems to be that you catch more bluegills with worms, (I suppose the redbreast fisherman feels the same way about this as a trout fisherman would about catching smallmouth bass.)

THE average angler uses a cane pole equipped with 10-pound test monofilament. The heavy line is in deference to the stumps, logs and other underwater obstacles encountered in stream fishing. A short piece of lighter monofilament on the hook end is often used to help convince the fish there are no strings attached to the bait. This will probably catch more fish, but lose a few hooks in the process.

Redbreast fishing with bait is usually done on or near the bottom. This involves using a sinker heavy enough to keep the bait down, but any heavier detracts from the sport. If there is any current, floats are seldom used since there will be no slack in the line and the strike is immediately noticeable. The redbreast usually takes the bait like a spawning bluegill—no playing around, just grab and go. If your cane pole is lying on the bank when a big one sets sail with your hook, you may have to get wet to get your fish.

Long-shanked wire hooks, size four to six should be satisfactory. The long shanks are for easier removal from the fish's mouth. Hook extractors save time and occasional damage to your fingers in addition to the humane aspect.

The redbreast is reportedly superior in taste to the bluegill, particularly early in the season. A standard method of preparation is skinning, followed by an overnight soaking in salt water before frying. But it's hard to beat freshly caught robin cleaned, battered and dunked in a big pan of hot grease. And the grease isn't hot enough until a medium-size robin will cook in the time it takes it to float across a big pan. Cook your cornbread the same way. People who say that they don't like fish will make liars out of themselves at a time like this.

It would be a great injustice to omit the great sport offered by the redbreast all through the summer and fall. Small lures, spinner or flyrod, will produce excellent fishing in redbreast waters right up to the hunting season. For some real sport, try wading a redbreast stream (you may be surprised to find how many little creeks have redbreast) in the middle of the summer with a light flyrod and popping bugs. Wet flies may be just as good, but you have underwater snags to content with. At any rate, you may find a real pleasant surprise waiting for you. ⬍

Tobacco Patch Doves

by Charlie Woodhouse

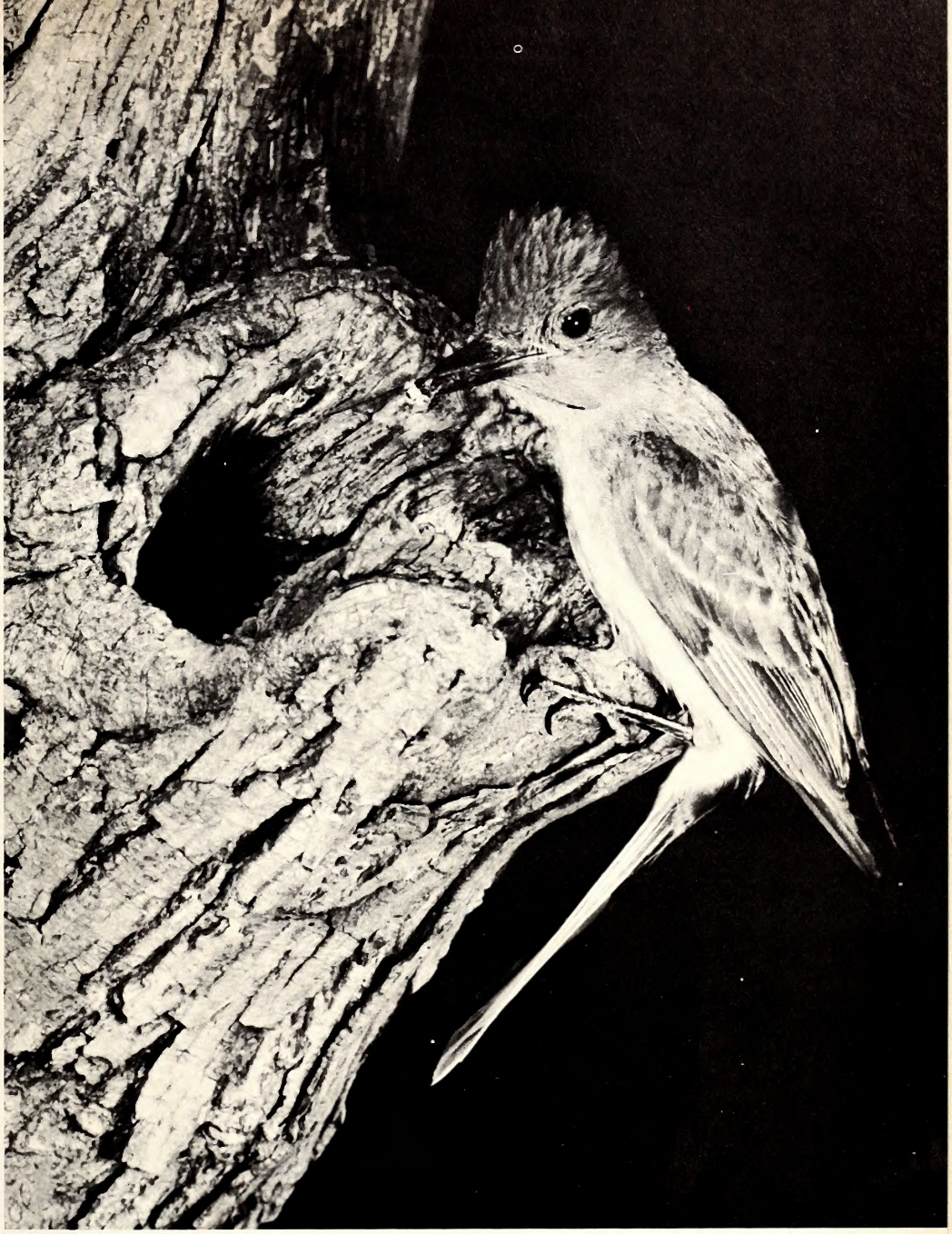
District Game Biologist

THE tobacco field sounds like the most unlikely place possible to go dove hunting. But strange as it may seem, some people are finding the shooting very good there. No, the doves have not yet acquired the "tobacco habit"; in fact, the tobacco crop is long gone when the doves are using the fields. They are attracted by a "second crop"—namely, browntop millet.

It is too late for the millet to be seeded and mature *after* the tobacco crop is harvested, so the trick is to get it in while the crop is still growing. This can be done where fifth row middles are left unplanted for slide rows. Millet should be planted in these middles at the rate of five pounds per acre, after the last tobacco cultivation is completed. Use a single row corn planter with a milo plate and gear it down to slow speed. Extra fertilizing is not necessary as there is usually plenty in a tobacco field.

The millet will act as a cover crop in the bare middles, and will not interfere in any way with tobacco harvest. The tractor and cart will straddle the row as the millet is growing. When harvest is completed and the stalks are cut and roots plowed out you have a nice clean, open field. This is what the doves like, and the widely spaced rows of browntop millet hanging full of seed are a definite added attraction. Act now and by next September you'll say, "come on, get your gun and let's see if those 'tobacco patch doves' are flying today!"

Above left, author Woodhouse examines browntop that was planted in the fifth row of a tobacco field. The dove hunter above is reaping the feathered harvest from the tobacco patch. A month's growth of the browntop is shown above. Tobacco harvest goes on without any difficulty as the millet ripens.



CRESTED FLYCATCHER

Nature's Feathered Architects

Text by Mrs. H. M. Draper, Jr.

Bird Chairman
Garden Clubs of N. C. Inc.

PHOTOS BY ALVIN STAFFAN
COLUMBUS, OHIO

IN her well-thought-out planning scheme, Nature has endowed her wild creatures with many varied and different occupations for use in the building of their homes. Some of the most interesting—and most surprisingly simple, yet sturdy—creations belong to those gay songbirds who so tirelessly furnish us with beauty and song, and police our gardens for insect pests the year 'round. The adaptability of the bird builder to its particular nest, and vice versa, is amazing!

Let us catalogue some of these interesting occupations. We have carpenters: they are the woodpeckers who painstakingly chisel and drill out nesting cavities in old trees and poles. The small members of this family, such as the downy and hairy, chisel out a cavity 6 inches to 12 inches deep; the flicker, whose beak is not so strong, may take advantage of a natural cavity; the redhead digs a hole 12 inches or more deep; while the beautiful pileated woodpecker, which averages 17 inches in length, must hew an enromous nesting cavity in a very large old tree!

Cavities made by woodpeckers may also serve as nesting places for such small birds as the chickadee, nuthatch, and tufted titmouse. To the woodpecker's nest of chips, they add a soft lining of feathers.

We have masons: among these are the robin, wood thrush, purple and boat-tailed grackles, barn and cliff swallows, eastern phoebe, and chimney swift. The robin and wood thrush build a 3-in-1 nest. Mud is used for their "inner nest" which sits inside an outer nest of twigs and grasses; after shaping the mud nest and allowing it to harden, this nest is lined with soft, fine grasses. The nest of the wood thrush is distinctive in that it usually has some paper strips or pieces of cloth woven into it and hanging down from it. The barn swallow plasters its nest of mud or clay, grass and feathers, under eaves of barns or bridges. Barn swallows like to use chicken feathers for warmth and decoration. The northern cliff swallow's nest of clay and mud, resembling a wasp's nest, is attached to the side of a cliff or under the eaves of an old building. We do not find their nests in North Carolina. The chimney swift uses saliva instead of mud for glueing its half-saucer-shaped nest of small twigs to the inside of a stone or brick chimney.

Baskets

We also have weavers: among these are the orioles and vireos. The Baltimore oriole's nest hangs like a basket from the tree branches, swaying gently in the wind. This bird drapes long grasses and other fibers over the twigs where the nest is to be located. The long strands of hanging material are then carefully woven in and out by the female bird to form her nest. Baltimore oriole nests may be found in our mountains; orchard orioles in central to eastern North Carolina. The vireos hang

their basket-like nest between forked twigs. They use tough grasses, shreds of bark, leaves, lichens, and perhaps strips of paper from a wasp's nest. The inside is lined with soft material, such as down, hair, or fine grasses. Vireos that may be found nesting in North Carolina include the red-eyed, white-eyed, yellow-throated, and blue-headed.

A large number of our favorite birds construct nests chiefly of twigs, which blend in with the tree, bush, or thicket in which the nest is built. Among some of the birds that build this type nest are the catbird, cardinal, scarlet and summer tanagers, blue jay, mourning dove, brown thrasher, chipping sparrow, and mockingbird. These birds will not use man-made nesting boxes, but prefer to build their own nests.

Some birds may build grass and weed nests on the ground. These include the horned lark, meadowlark, field sparrow, dickcissel, towhee, and junco (this "winter visitor" only in Piedmont and eastern North Carolina may be found nesting in our mountains). The song sparrow may build on either the ground or in bushes.

Since eggs of small birds break easily, they need protection of a nest that is soft. The chipping sparrow lines her nest deeply with horsehair, if she can.

The nest of the tiny ruby-throated hummingbird (our only native hummingbird east of the Mississippi) is like a fairy cradle covered with lichen from the bark of trees and lined with plant down. The appearance blends in so perfectly with the branch on which it is located that the nest is easily passed by, unnoticed.

Perhaps the most careless birds about nest-building are some of our seashore birds, such as the common tern, least tern, and black skimmer, which merely make depressions in the sand, sometimes lining them with grasses or seaweed. The speckled eggs in such a nest are almost invisible as they blend so perfectly with the natural surroundings. On a walk along the end of a beach I once found such a nest, and had the parent birds dive and scream at me in an attempt to frighten me away. Leaving the particular spot where the nest was located and returning later, I was completely unable to rediscover the nest, and its speckled eggs, in the sand!

The red-winged blackbird laces its nest to reeds or low bushes near marshy places. It is woven of marsh grass and lined with finer grasses.

We mere humans continue to marvel at the resourcefulness of birds in finding nesting materials or in adapting unusual places to their needs. The *New York Times* in May, 1965, reported in a picture article a wren nesting in a ball of twine, a robin nesting on a telephone in a public telephone booth—rather than disturb the robin, the telephone company set up another booth—and another robin nesting in a berry basket hung by a gardener in a rose bush. Still another robin availed herself of paper excelsior, which she used to supplement grasses, leaves, rootlets, and other natural supplies. A wood thrush nest has been seen woven almost entirely of cellophane, and looking like a silver basket resting in a rhododendron bush. We have heard of wrens building in clothespin bags, and almost every spring the newspapers report on bluebirds that build in mailboxes.

Studying birdnests is an interesting hobby; oftentimes, though, unless you have actually seen the birds on or around the nests, they may be difficult to identify as to owners!

BLUEBIRD

HOODED WARBLER

BLUEWINGED WARBLER

MARSH HAWK

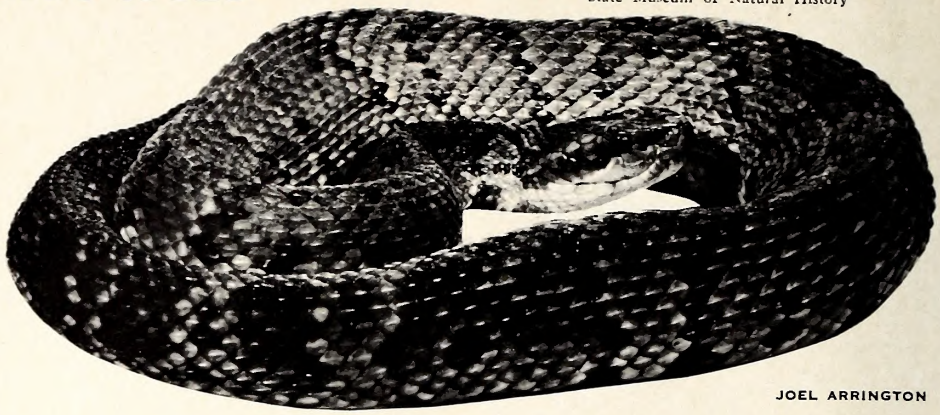
LEAST BITTERN

BARN SWALLOW

HERRING GULL

The Cottonmouth

by Franklin F. Snelson, Jr.
and William Palmer
Cornell University and N. C.
State Museum of Natural History



JOEL ARRINGTON

WHEN the average fisherman sees a snake swimming in the water or coiled in a bush overhanging it he is apt to immediately, and more often than not incorrectly, identify it as a cottonmouth or "water moccasin." It makes little difference whether the snake is seen in a Piedmont farm pond, along a coastal river or tributary, or struggling in the rapids of a trout stream.

It must be admitted that the identity of the venomous eastern cottonmouth, *Agkistrodon piscivorus piscivorus,* is often difficult to quickly ascertain, since there are at least two species of harmless water snakes that commonly occur in the same general habitat and that may often resemble the cottonmouth. The adults of these harmless forms are large and heavy-bodied, often with the pattern obscured or almost obliterated, and not infrequently with a wide "triangular-shaped" head. However, the cottonmouth possesses a conspicuous pit between the eye and the nostril, and a single row of scales on the underside of the tail. (Both of these characters are found in all of our native venomous snakes except for the coral snake and are lacking in all harmless forms.)

Needless to say these characters can be safely checked only on a dead snake! The characteristic habit of rapidly vibrating the tail and gaping the mouth when aroused will often aid in distinguishing this venomous species from the water snakes. Coloration is extremely variable and may be shades of brown, olive, or occasionally yellowish. Juvenile and sub-adult specimens often are brightly marked with conspicuous brown crossbands, typically with dark brown or black margins. Large adults also may be rather brightly marked but more often exhibit only obscure traces of pattern. The underside is dirty white mottled with black rectangular spots that are most evident along the edges of the belly.

Adult cottonmouths average less than 4 feet in length. The largest specimen that we have examined is in the State Museum and measures 71 inches. There is some question, however, as to whether this particular individual was collected in North or South Carolina. Regardless, the cottonmouth certainly is among our largest venomous snakes.

Represented by two subspecies, the cottonmouth occurs from the Great Dismal Swamp and vicinity in southeastern Virginia south throughout Florida and west to east-central Texas. Northward the distribution extends through eastern Oklahoma, the southern portions of Missouri and Illinois, and the western parts of Kentucky and Tennessee. Contrary to popular belief, the distribution in North Carolina is generally confined to the Coastal Plain with what appear to be a few small colonies in the extreme lower Piedmont. This species is most common in the extreme eastern swamps and waterways where it is often "uncomfortably" abundant.

Almost any permanent or semi-permanent body of water in the lower Coastal Plain may harbor the cottonmouth. During the late summer droughts when water in the swamps is confined to scattered small pools, this species congregates about such refuges and may be observed in large numbers. We know of three collectors who secured over 100 specimens in two days of field work in Columbus County during such a drought.

An indiscriminate feeder, the cottonmouth feeds upon fish, amphibians, other reptiles, mammals, and occasionally birds. A large specimen kept in captivity for many years at the State Museum had to be isolated during its first few years as a captive since it persisted in eating every snake placed in it's cage, *even members of its own tribe!*

Breeding occurs in the spring and the young are born alive usually in August and September. At birth the juveniles are about 10 inches in length and number up to a dozen per litter. Newly born cottonmouths are brightly colored and resemble the young of the copperhead.

Cottonmouths are very dangerous and capable of inflicting a fatal bite. The danger is further accentuated by the fact that many specimens are slow to retreat when encountered, and some will actually stand their ground, vibrating the tail and holding the mouth open disclosing the white interior from which came the accepted common name. Although this aggressive display is not infrequent, most individuals that we have observed in the field, when given the opportunity, fled in the manner of most other snakes.

Unless one is absolutely certain of its identity it is wise to give a wide berth to all aquatic snakes found in the Coastal Plain. Frog hunters and night fishermen should be especially careful since cottonmouths often are nocturnal during the warmer summer months.

NORTH CAROLINA WILDLIFE

RESOURCE-O-GRAM

A ROUNDUP OF THE LATEST WILDLIFE NEWS

Public Hearings Set to Consider Hunting Rules

Nine public hearings have been scheduled by the Wildlife Resources Commission to give Tarheel hunters a voice in setting the 1966-1967 regulations for hunting non-migratory game. This year an effort will be made to record suggestions so that persons attending the hearings and making suggestions can be notified of any action taken on these when the seasons are established.

Following are dates and times of hearings:

May 10, 1966	District 9	Sylva	Courthouse	7:30 p.m.
May 11, 1966	District 8	Morganton	Courthouse	7:30 p.m.
May 12, 1966	District 7	Yadkinville	Courthouse	7:30 p.m.
May 13, 1966	District 6	Albemarle	Courthouse	7:30 p.m.
May 16, 1966	District 5	Graham	Courthouse	7:30 p.m.
May 17, 1966	District 4	Elizabethtown	Courthouse	7:30 p.m.
May 18, 1966	District 3	Rocky Mount	City Court Room	7:30 p.m.
May 19, 1966	District 2	Jacksonville	Courthouse	7:30 p.m.
May 20, 1966	District 1	Edenton	Courthouse	7:30 p.m.

Forest Fires Still a Potentiality

Although at press time fishermen and other outdoorsmen had not been banned from the woods because of forest fire hazard conditions, the Wildlife Commission urges fishermen near wooded areas to be extremely careful with fires. The month of May usually brings protracted drouth, and with dry woodlands and low humidity the danger of forest fire even from a smoldering cigarette butt can be serious.

Striped Bass Hatchery To Be Ready May 1

The Wildlife Resources Commission expects to have a completely new striped bass hatchery at Weldon completed by May 1, in time for the spawning run of these important game fish. Meanwhile Commission officials were hoping that arrangements could be made with the U. S. Corps of Engineers and power companies to get a flow of water down the Roanoke River sufficient to take care of the spawning needs of the fish.

The old striped bass hatchery at Weldon was the first of its kind in the world.

Park Fishing Regulations

Great Smoky Mountains National Park fishing regulations are available from the National Park Headquarters, Gatlinburg, Tennessee. The trout fishing season opened April 15, and continues through September 15 in the park.

Conducted by John Parker

LAST October in this space, we commented on fire extinguishers and the boats on which they are required (the rules are of long standing). We mentioned that we considered it wise to carry this equipment on all power boats (and we still do). Also we listed the U. S. Coast Guard's new criteria for determining closed construction in small craft.

Fire extinguishers and closed construction go hand in hand and the subject is considered again because on June 1, 1967, the "other part" of the new ruling takes affect. What other part? The proper ventilation of closed construction boats. True, boats, large and small, have been properly and improperly ventilated for years. The new interpretation, clarification, amendment to an old law or whatever one wishes to call it, is a move toward greater safety afloat. In other words, if you have, by the new standards, determined that your outboard, inboard-outboard or other craft has closed construction (Closed construction is inherent in most boats except the outboard and more and more of these will be covered by the new interpretation.), then you will now be required to properly ventilate those areas.

It is anybody's guess as to the number of boats affected. A leading marine trade journal states that "a large part of the boat inventory will not pass the ventilation law and many of the boats which have been improved by their owners will now come under the law." The latter part of this, no doubt means that many boaters, by adding cabins, cabinets, tank enclosures, etc., have put their craft, which may have been originally of open construction, in the closed construction category.

It would be impractical and perhaps misleading if we attempted to explore the many ramifications of ventilation, closed construction and venting systems including flexible ducting, built-in ducts, cowling, electric blowers, etc. We will skip the mechanics because the requirements for each boat vary. Since the greatest area of doubt will involve the outboard or inboard-outboard, it may be of some value to again list what, under the new interpretation, constitutes closed construction. Look for: (1) Closed compartments under thwarts and seats wherein portable fuel tanks may be stored. (2) Double bottoms not sealed to the hull or which are not completely filled with floatation material. (3) Closed living space. (4) Closed storage compartments in which combustible or inflammable materials are stowed and (5) Permanently installed fuel tanks.

As this goes to press, the deadline for enforcing the "new" ventilation law has been extended to June 1, 1967. But why not put in proper equipment right now?

The following items would not by themselves constitute closed construction. These could be considered exemptions: 1. bait wells 2. glove compartments 3. buoyant floatation material 4. open slatted flooring and 5. ice chests.

Step number one is deciding whether or not your boat is of closed construction. Step number two would entail appropriate venting. The existing vent system may be satisfactory or it may only need modification. Requirements will vary from one boat to another and we suggest that you discuss the pecularities of your boat with your dealer, a Coast Guard official, a wildlife protector or an expert from one of the volunteer organizations such as the Coast Guard Auxiliary or the U. S. Power Squadrons.

Finally, for those of you who enjoy delving into the letter of the law, here is the one that we have been talking about:

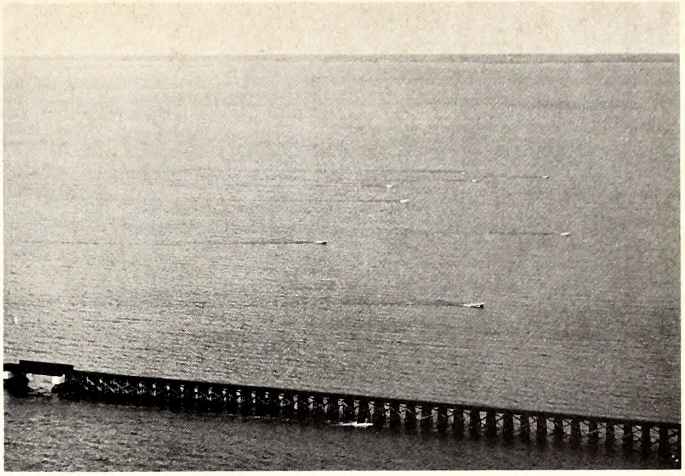
"All motorboats or motor vessels, except open boats, the construction or decking over of which is commenced after April 25, 1940, and which use fuel having a flashpoint of 110°F. or less, shall have at least two ventilator ducts, fitted with cowls or their equivalent, for the efficient removal of explosive or flammable gases from the bilges of every engine and fuel tank compartment. There shall be at least one exhaust duct installed so as to extend from the open atmosphere to the lower portion of the bilge and at least one intake duct installed so as to extend to a point at least midway to the bilge or at least below the level of the carburetor air intake. The cowls shall be located and trimmed for maximum effectiveness and in such a manner so as to prevent displaced fumes from being recirculated."

Cold Preserver

If ever we presented an untimely tip, this is the one. But since life saving devices were discussed at length last month, perhaps this will help complete that discussion. Again, from the Local Notice To Mariners comes an interesting safety tip. Keep it in mind for next fall.

"Coast Guard Merchant Marine inspectors observed that vinyl dip coated plastic foam life preservers with approval number between 160.055/1 and 160.055/49 stowed on open decks became much less flexible in cold weather. This loss in flexibility could prevent a person from stretching the head opening wide enough to don these life preservers. All vessels on routes where the air temperature will be below 28°F. that have on board unicellular plastic foam life preservers are advised to check

Your best boating friends? They could be, if you have one of them on in time of trouble. Is yours Coast Guard approved?



Down there are part of about 20 Wildlife Commission boats continuing search for a boating accident victim. Don't be one.

them for donning at these low temperatures. Those life preservers that cannot be donned at low temperatures should be stowed inside. The production of these life preservers has been stopped. Those life preservers now on production with approval numbers 160.055/50 and over may be donned in cold weather without difficulty."

Boating Accidents—1965

That not-so-pleasurable aspect of pleasure boating, the boating accident took a higher toll on North Carolina mariners than in any previous year for which we have records. A total of 112 accidents were reported to the Wildlife Resources Commission last year. These accidents occurred on public waters and as we have pointed out in the past do not include boating accidents occurring on farm ponds, private lakes, etc., unless they are open to the public.

A close look at the total reveals 63 fatalities included in 51 fatal accidents. There were 61 non-fatal accidents reported. There were 19 more fatalities reported for 1965 than for 1964. Also the total number of accidents rose by 24.

The accident story of last year, except for the general increase in numbers was very similar to 1964. Falling overboard, capsizing, and collision were again leading accident types. Life saving devices were usually not being worn.

There were fires and explosions, groundings, hull failures due to rough water, two boat collisions, collisions with underwater objects, collision cases where the operator was "looking back at the skier," small craft caught in breakers or ocean inlet turbulence, pure and simple overloading, boat-swimmer collision, control malfunction, plus a dozen or so other causes or excuses.

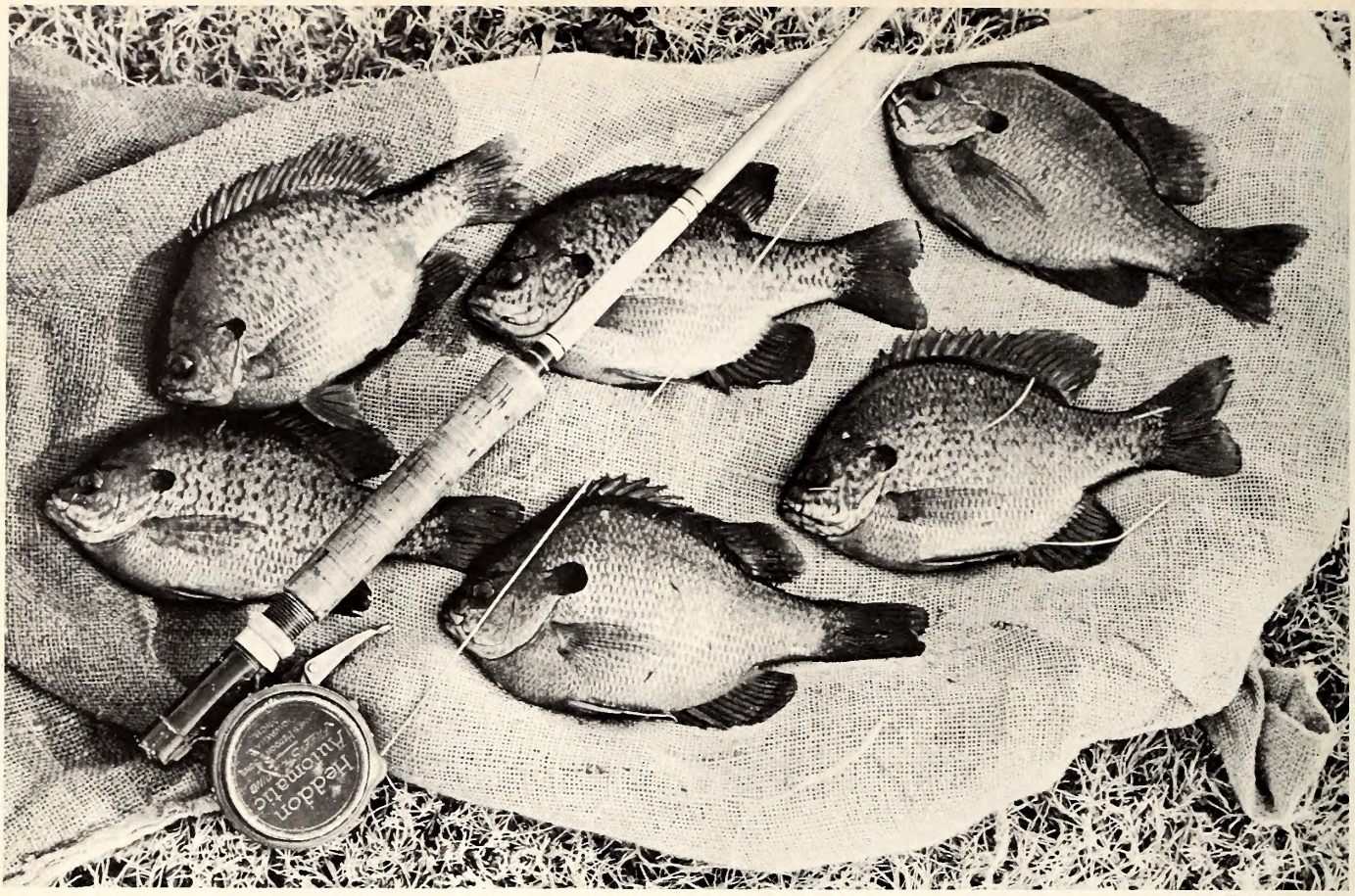
The age of those operating a boat involved in an accident is always an interesting aspect. Last year, as in years past, most operators were over 20, 87 percent to be exact. The break down is: 13 percent —19 or under; 24 percent—20 to 29; 21 percent—30 to 39; 20 percent—40 to 49; 12 percent 50 to 59; and 7 percent—60 to 69.

The place? It varies little from year to year when we consider the total. There were a smattering of fatal and non-fatal accidents (one or more) in most of the eastern counties, and a few in western counties. The majority of the 1965 boating accidents occurred again last year on: the Yadkin and Catawba River chain of lakes in the Piedmont, White Lake in Bladen County, the Wrightsville Beach and Upper Cape Fear River area of New Hanover County, New River in Onslow County, Columbus County (especially in the Waccamaw River), the Morehead City area, Slocum Creek on the Neuse, upper Pamlico River at Washington, and the lower Chowan River.

Nautical Chart Agents

These agents sell nautical charts and related publications of the Coast and Geodetic Survey. Agencies marked with an asterisk also handle certain U. S. Coast Guard publications.

Bayboro: Ensley's Radio Company
Beaufort: Beaufort Florist, 121 Turner Street
Belhaven: River Forest Manor
Charlotte: Duncan Printmakers, Inc., 315 East Seventh Street
Coinjock: Coinjock Esso Marine Dock
Elizabeth City: Riverside Boat Works, 808 Riverside Avenue
*Fayetteville: A. K. McCallum Company, 715 Ramsey Street
*Jacksonville: Carolina Office Supply Company, 624 New Bridge Street
Kinston: Neuse Sport Shop, Highway 70 East
Manteo: Eastern National Park & Monument Association, Cape Hatteras National Seashore
Morehead City: Dee Gee's Gift Shop, On the Waterfront Woodies Groceries, 703 Arendell Street
Nags Head: Nags Head Ice & Cold Storage
New Bern: Barbour Boat Works, Inc.; Trent Marine Service
Raleigh: Raleigh Blue Printers, 126 W. Martin Street
Southport: Elizabeth River Marina, Long Beach Road
Washington: Kugler-Nicholson, Inc.
*Wilmington: O. E. Durant, Water and Market Streets
Wrightsville Beach: Wrightsville Marina



King's Sport / Pauper's Budget

by Jim Dean

Burlington Daily Times-News

THE man who has a balmy spring afternoon to spend fly rodding for bluegills is the luckiest man in the world.

There's not a sporting thrill in the world that has quite the same absorbing appeal as a day spent paddling lazily around a willow-fringed or lily-padded pond fly fishing for bluegills, or bream as they are called in this part of the country.

The rewards you enjoy cannot be measured by the number of fish caught, and the pleasant sights and sounds of such an afternoon are familiar and compelling.

When the shadows begin to lengthen across the pond, most fishermen, myself included, are content to sit back and admire the batch of fat bluegills that have provided the day's excitement.

At such times, the true sportsman is most likely to wreath himself in a fog of pipe smoke and meditate on the ridiculousness of even considering the possibility that life offers a finer moment.

The gateway to this fascinating and soul washing contentment is wide open to anyone who is interested, and there's nothing dull about the sudden, exciting "Spat" of a bluegill hitting your floating popper.

No sound in this whole wide, rat-racing world can bring an office worker home before five o'clock quicker than the sudden recollection that "Spats" are likely to be ringing sweet music on the pond behind the house.

Few fish that swim have the magnetic drawing power of a bluegill, and during the spring spawning season when bluegills are on their beds, advocates of the sport can expect to find their daydreams punctured with the "Spats" of feeding bluegills.

The instigator of this madness is a relatively small, saucer-shaped member of the sunfish tribe. In the south, he is almost invariably called a bream (pronounced brim), and most of the cane pole crowd consider him the next best thing to grits, clabber biscuits, and black strap molasses. Farther north, he is usually called a bluegill, but is occasionally referred to in other colloquial expressions (depending upon whether he's biting or not).

Lepomis macrochirus — as some studious nonfisherman tagged him—is recognizable by the blue-black "ear" on his gill plate. His body is stubby, and most of them are about the size of your hand. He rarely weighs more than a pound, although larger ones are occasionally caught. His oval mouth (reminiscent of a defunct Edsel's front grill) makes diminutive lures a necessity.

Particularly rambunctuous bluegills will hit a bass plug once in a while, if the mood strikes them, but they are usually not hooked.

Where Are They?

Bluegills generally spawn in the spring in fairly shallow water, making large round depressions, called beds, which can usually be seen on the bottom. During this period, they will sock anything that is placed over them, and for their size, put up one of the most persistent tussles of any fish you're likely to hook.

Some oldtimers claim that you can locate a bed by the fishy smell, and as odd as it seems, there are those who enjoy a certain amount of success with this technique.

After the water warms up, bluegills leave their beds, and scatter around the pond. This makes them more difficult to catch, although some prefer to fish for them after they've left the beds, because they can randomly fish the whole pond, rather than concentrate on a few hot spots.

During the middle and late summer, bluegills are found in water ranging from a few inches to several feet in depth; however, most are caught in relatively shallow water around old stumps and lily pads. Generally speaking, the closer you can lay your popper to an obstruction, the more likely you are to be rewarded with that ear tingling "Spat."

Tackle

Fly rodding equipment for this sport varies with individual tastes, and need not be expensive. Fly rods are also much easier to use productively than tradition would have us believe. You don't have to be able to lay out a long line to load a stringer with bluegills. Most are caught within 40 feet of the boat.

My preference is a fairly light fly rod of not more than eight feet. The reel, being merely a line holder, in this kind of fly fishing, is relatively unimportant. I prefer a single action reel, but will admit that for those who fish entirely from a boat, automatic reels have at least one advantage in that the automatic winding mechanism helps you avoid tangling a lot of loose line with other equipment in the bottom of the boat. I also prefer a double-tapered or weight forward fly line, but since distance and delicate presentation are not too important, most will find that a level line will do, and the initial expense is less.

Bluegills are not particularly leader shy, and long fine leaders are rarely necessary. I find that a leader of seven feet or less is sufficient, and because of the likelihood of hooking a large bass among the stumps, I use one which tests at least four pounds at the tippet.

Selection of lures for bluegills is more a matter of fisherman's choice than fishes'. A small white or yellow popping bug is good, especially if it has rubber legs. In choosing a popper, be sure that the point of the hook is not too close to the body of the bug, or you'll miss a lot of strikes.

Foam rubber spiders with rubber legs are very good, and occasionally a small popper with a tiny split shot pinched on a foot or so ahead of the lure will get those in deeper water. Streamers are also excellent at times, provided they are fished very slowly.

Small metal spoons, designed for fly rods, are often the ticket to success, but since they are difficult to cast, I rarely use them.

Unlike most fishing techniques, the object is to give the lure as little action as possible. The floating popper should never be "popped" as in bass fishing, and should rest on the water, without movement, for a good while, since bluegills often lie under a floater for a long time before deciding to take it. Some of the best strikes I've ever had happened after I had left the popper lying on the water for a minute or two while doing something else. Occasionally, a very slight twitch may help, but this is the exception rather than the rule.

In the spring, after the shad run has subsided, the trout streams are crowded, and the days are balmy, give these scrappy little rascals a try. You'll find them in most any body of fresh water, and you never can tell when some moss-backed old largemouth is going to engulf that little popper, and leave you a snipped leader and a broken heart.

Flyrods and bluegills go together like grits and red-eye gravy, and you'll look a long time to find a more rewarding sport.

LUTHER PARTIN

Wild Flowers, Nature's Bonus

by Margaret S. Sturges

Spring Beauty — what more apt name could you ask than that for the carpet of loveliness at right? Come with artist — writer Margaret Sturges and enjoy nature's Bonus.

JACK DERMID

WILD flowers in our part of the state are creating new enthusiasm among home gardeners. Flower lovers, inspecting private gardens opened for public display, are getting wonderful ideas for the growing popularity of wild flower gardening.

Recently I visited a private wild garden in Winston-Salem which has impressed botanists and amateurs alike. The whole yard of slopes and terraces, made rich and woodsy, and with natural trails leading to a rocky stream, is seen from a high overhanging porch. Surrounded by green ferns, mosses and many water-loving plants, a pond complete with gold fish and frogs is the focal point of this exquisite sanctuary of native wild plants. The rich soil was created with the use of leaf compost, making the great variety of plants large and healthy in their natural habitat.

"It's taken a long time," my hostess told me, "to learn, through experimentation, which plants thrive best in certain places. I've moved some from one side of the garden to the other, or to a different elevation, at the same time planting them so that blooms will compliment each other. The tall hardwood trees are trimmed high, so that smaller trees and shrubs will grow beneath," she explained, pushing aside a primitive earlobe magnolia to show me some retiring, shade-loving trilliums. Ferns and wild flowers flourished beside the path.

My interest in wild flowers grew one spring when I was sketching in our back-yard. My drawings were simple, but I recorded in detail all the wild flowers growing in our small portion of nature's own garden, within the boundaries of our fence.

"You're doing it the hard way," my husband said. "Why don't you buy a book?"

"But she's having fun!" our teen-age daughter assured him, as she examined my latest dewy specimen through a magnifying glass.

Since I've learned their rustic names, they've become living personalities. Each season I've added wild flowers to my small flower beds and more sketches to my records.

FOR those who like fancy cooking, try growing your own herbs. It's interesting to learn which plants the Indians and pioneers used for food and medicine, and for making dyes. Wines can be made from dandelions and blackberries growing wild. No garden seems complete without some berry bushes and sweet wild strawberries.

The bird watcher could hardly resist making a garden to allure the birds. Among the wild flowers in North Carolina are many that seem to have been created just to attract seed eaters, berry eaters, hummers and insectivorous birds.

The amateur photographer may be interested to know that The New York Botanical Garden, Bronx, New York, will pay well for sharp, clear color transparencies wanted for a wild flower book being published this year. Write them for a list of southeastern flower pictures needed.

Fresh wild flowers make lovely, fragrant bouquets. The flower arranger can make good use of flowers growing nearby; and colorful arrangements made from your own dried flowers combined with a twisted root, lichen, pine cones and rocks brought home from nature's abundant supply, are pleasures for winter days.

With a wild garden in mind, you'll find the whole family enjoying purposeful walks. We all have some gypsy in us. For anyone interested in the ways of nature, prowling the woods will provide you with a wider knowledge, and benefits from the fresh air and exercise.

If you plan a wild garden of your own, you'll want to go exploring first. A small notebook to jot

JACK DERMID

Its foliage laced by spring sunlight, the moccasin flower (left) displays its radiance. Below, purple trilliums brave a sudden shower and come up smiling with colorful leaf patterns.

JOEL ARRINGTON

down the habits and blooming seasons of wild plants will be useful. There's no need to go far afield. How little we know of the shy, wild flowers of the woods, or of the showy familiar ones, until we take a few excursions into the countryside, alert to beauty, color, shape and scent—or into our own back-yards.

You may want to buy a wild flower book to help you to identify them by their popular names and scientific names. For example, a cardinal flower is also a *lobelia cardinalis,* and a columbine is an aquilegia, so named because it is eagle-like and has long, slender spurs.

Bearing in mind conservation, preservation and trespassing laws, as well as poisonous plants to avoid, go out and see what marvelously refreshing gifts nature provides seasonally and without fail.

WHEN the dogwoods are dazzling white and creamy pink, it's time to make your selections in the woods, marking specimens with a loosely-tied tape so that you'll find them in the fall at planting time, thus having white or pink, as you prefer. White-blooming dogwoods turn pink when nails or steel shavings are placed near the roots.

Redbuds, flame azaleas and rhododendron are among the small trees suitable for transplanting. They'll enhance any garden or lawn.

Having made notes of the places where easy-to-move plants grow, select with care, being sure to leave enough roots or seeds for natural propagation. *There are laws regarding the picking of some flowers,* and preservation is encouraged. Garden club members and others interested rescue all the wild flowers they can find when bulldozers are moving in to clear land for development.

Use plantings to give your garden privacy, or to hide an unsightly view. A seventeen-year-old boy in Albuquerque, New Mexico, is working with wild honeysuckle, cypress and privet to block from view his father's automobile salvage yard. I'm sure others across the country will follow his example in view of Mrs. Lyndon Johnson's National Beautification Program.

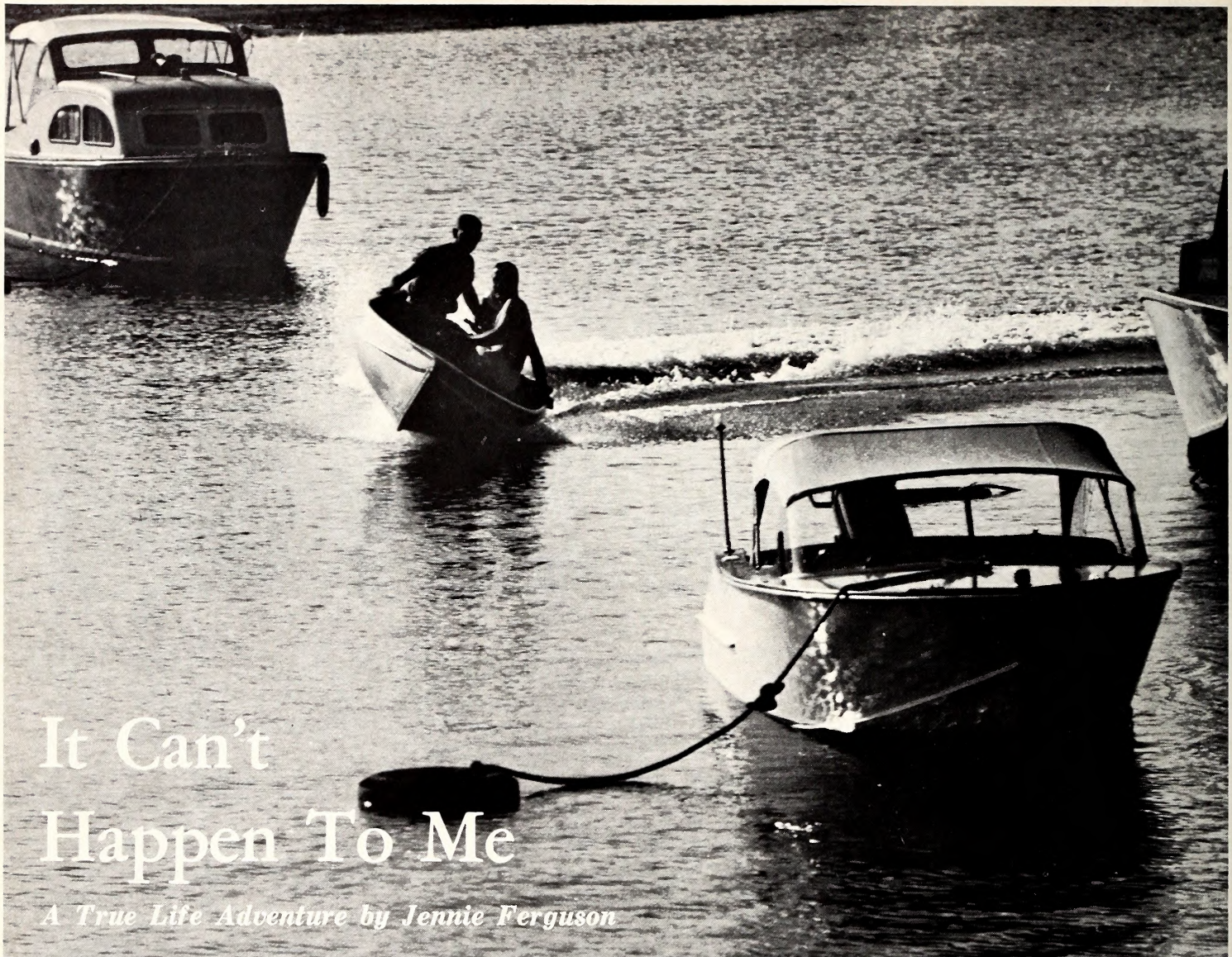
Before selecting the site in your yard for a wild garden you may want to have a soil-test made by the County Agent or the State Agricultural Department. If your soil isn't suitable, improvements can always be made. Nurseries sell just about everything to create good gardens; they even sell wild flower seeds. Your soil may not need much preparation, making it easy to specialize in plants that will readily adapt to it. In hard soil, mix in some humus, compost or peat moss, and spade about six inches deep.

Among the plentiful varieties of wild flowers found in North Carolina there are hundreds suitable for a wild garden. This chart shows only a few.

As you will see from the chart, (page 31) some flowers are best grown from seed. Plant seeds in pots or flats, leaving them outside all winter, and transplanting when the ground is workable in the spring. Wild plants easiest to move are those with bulbs or fleshy roots. Start with easy-to-grow flowers, and don't overlook the familiar ones.

Transplanting is best done on a cloudy day when there's no wind. Having provided the proper environment as to sunlight, moisture and indigenous soil, plant your wild flowers as they grow in their natural habitat. Avoid the artificial. A natural grouping is best, and not too much cultivation. Some flowers, such as the Virginia bluebell, bloodroot, trillium and squirrel corn, will not bloom for two years or more.

In these days of manufactured abundance, there's nothing quite as uncommon as the common gems of the wild. You'll have a new appreciation of them—in your own backyard!



It Can't Happen To Me

A True Life Adventure by Jennie Ferguson

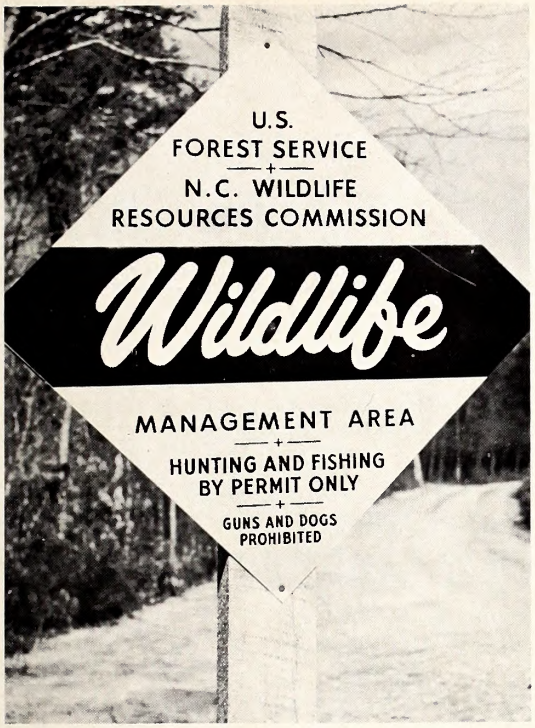
THE river and all its boats seemed to be taking a late afternoon nap. It had rained a few hours earlier and had cooled the hot, sultry summer afternoon. Bill and I could tell it was getting late by the position of the sun in the cloud-sprinkled sky. We started rowing back across the river after an eventful afternoon of excursions.

We were about half-way across the river when the whine of an outboard motorboat attracted our attention. It was a medium-sized, broad-beamed runabout. The outboard had three occupants, two of whom were sitting up front facing the driver with their backs to us. All three of the boys were watching the beach to their right. Bill and I were headed toward a pier near the beach. The outboard was going about 20 mph down the middle of the river. We first thought the boys were going to see how close they could come to us without hitting us; but as the seconds passed we realized they were not looking ahead of them at all. If they didn't turn they would have to hit us.

A feeling of helplessness came over us. There was nothing we could do to keep from getting hit. Bill and I began to yell at the top of our lungs. Why couldn't they hear us? One of the boys up front finally looked around and saw us. He quickly turned toward the driver and told him to turn. Bill and I began to stand up so that we could jump. Unfortunately, it was too late. The outboard cut right into us.

The next thing we knew, we were in the river. My legs were so badly hurt that I could not move them; I could not swim. Luckily for me, Bill was a life guard and was able to hold me up. I didn't have to worry about saving myself.

The boys, in the other boat, helped me into their boat and then took Bill and me to our pier. The accident had been seen by the life guard on the beach, my aunt and uncle, and the Davises. They were all on the pier waiting to help us. The four boys were shaken up but not hurt. I was bruised from my waist down and had broken a big blood vessel in the back of my right leg. I had red bottom paint from the other boat on the back of my bermudas. I am going to keep them as a reminder of how lucky I was as well as how dangerous carelessness is on the water. The accident was the fault of the driver of the speed boat. It was an experience none of us will forget. One lesson I learned was: always wear a life preserver when in a boat.



Wildlife Management Area Hunt Report - 1965 - 66 Season

by **Frank B. Barick,** Chief, Division of Game
Andrew J. Weber, Game Research Project Leader
Jerry Wood, Data Processing Manager

IN terms of hunter participation and harvest, the 1965-66 season was "average," but several aspects of the hunts were different from previous years. Most of the innovations accomplished their objectives, but to varying degrees. In this report we shall first present an appraisal of these innovations, then briefly discuss some of the new insights of hunt management resulting from new data collected during the hunts, and finally outline some of the new ideas under consideration for the 1966-67 season.

Appraisal of 1965-66 Innovations

One of the most successful innovations, at least in regard to hunter acceptance, was the $3.00 season permit for small game hunting. Many hunters bought this permit in place of the daily permit for $1.50 and the indication by season's end was that most hunters would have bought this permit if they had known of it sooner. But even with the initial delay in use, those who did buy it averaged 2.41 hunting trips for the season, for a saving of 20 percent in permit costs. It was also obvious that this permit encourages more small game hunting since hunters can take advantage of free part-days without having to buy a separate permit each day. It is expected that most hunters will prefer this permit next year and some consideration is being given to dropping the daily permit in the future.

Use of the half-price daily small game permit for minors was disappointingly low. Apparently many minors who had time to hunt found that the season permit was a better buy. Only 65 of this type of permit were used by 55 different hunters. Continuation of this type of permit is also being questioned.

Increasing the total number of days for small game and raccoon hunting appeared to increase participation and kill. There were 259 small game days for squirrel and grouse, up 47 from 212 the previous year. Total number of hunter days was 7,749 in comparison with 5,217 last year. The squirrel kill was 7,903 in comparison with 4,216 last year but the grouse kill was 184 in comparison with 323 last year.

During the 78 days of raccoon hunts there were 1,779 hunter days of use and 458 kills in comparison with 64 days of hunting, 1,167 hunter days and 293 kills last year.

Archers were nearly unanimous in their approval of reversion to the "late" season in contrast to the earlier season some had requested the previous year. Some dissatisfaction was expressed in regard to the closure of the Edgemont check-station on Daniel Boone but participation was generally improved over the previous year. Kills were also up from 66 last year to 74 this year.

The total deer kill was down slightly from last year but this was according to plan rather than reduced hunter success rate. The either sex deer season on several areas was cut back in anticipation of a reduced fawn crop last spring. Thus the either sex deer harvest was reduced from 1,330 during the 1964 season to 795 this past season. Buck kills were back up to near peak levels at 1,211 in comparison with 881 the previous year when the near-universal mast shortage resulted in a delayed rut and poor kills on many areas.

The accumulation of deer herd age composition and condition data made it possible to scale either sex deer seasons to anticipated rates of reproduction. This approach is designed to maintain relatively stable populations by scheduling more days of either sex deer hunting on areas showing higher reproductive rates. This procedure also holds winter fawn mortalities to a minimum. On areas where examination of ovaries of female deer taken during the either sex season shows an expected fawn drop of more than 1.25 per doe, three days of either sex season were scheduled. Fewer days were scheduled

on areas where the reproductive index was lower.

Either sex deer hunts were also used to expand clientele of the Gloucester section of Pisgah and "off-phase" either sex deer hunts were used to reduce the herd on Bent Creek of Pisgah. In this latter case, Southeastern Forest Experiment Station workers were being hampered in developing hardwood regeneration methods by an excessively large herd. To curb this influence, hunters were allowed to take deer of either sex during part of the buck season in addition to the regular either sex season.

New Hunt Management Information Developed

During the 1965-66 season checking station personnel recorded two new items of information that is yielding new insights pertinent to hunt management. The hunting license number and "zone of residence" of each hunter was recorded on his permit stub. This information, as well as the other data in regard to date, area, kill, etc., was punched into machine data cards and subsequently machine-processed.

By recording the license number of each hunter it was possible to determine for the first time the total number of different hunters using these areas, the number of times they hunted, and their average kill. By recording the "zone of residence" (Zone 1 = 0-20 miles from checking station, zone 2 = 21-60 miles, etc.) of each hunter it was possible to determine for the first time how far the average hunter traveled to his favorite hunting spot and whether the most kills were made by local people or those who live at considerable distance from the area.

Local hunters (those who traveled less than 20 miles to hunt) seemed to have an edge over hunters from other zones in killing a deer. On the buck hunts, local hunters made 3.29 fewer trips per kill than hunters from other zones. This same relationship held true on the either sex deer hunts where local hunters made 4.18 fewer trips per kill. Whether this difference is due to a more proficient hunting ability or to familiarity of the area remains to be seen.

However, the data indicate that the success rate of hunters from areas of considerable distance increases with each additional day spent hunting. This holds true for both the buck and either sex hunts.

Another useful segment of this information is the time of day that the hunter made his kill. These data indicated (as could be expected) that the morning hours are the most productive. Approximately 69 percent of all deer killed on the buck hunts were killed before noon and 37 percent on the either sex hunts. On both types of hunt, the most productive hours were immediately after the start of the hunt.

Thirty-six percent of the total number of hunters using the areas during the buck hunts were local hunters, 39 percent were from intermediate distances while 25 percent were from over 60 miles away. During the either sex hunts 40 percent of the hunters were local, 35 percent were from intermediate distances and 25 percent were from over 60 miles away.

New Ideas Under Consideration for the 1966-67 Season

Increasing human populations, shifting from the country to the city, and increasing leisure time are accelerating the demand for public hunting areas. Hunting on Commission-managed wildlife areas during the past ten years has expanded much more rapidly than hunting in general. More people are using the management areas more frequently than ever before. This means that we are faced with either a reversion to broad-scale rationing of hunting opportunity or expansion of the public hunting area program.

The Wildlife Resources Commission has elected the latter course and has authorized establishment of new public hunting areas by cooperative agreement, lease, and purchase when funds become available. Several new big game areas appear to be available, some on U. S. Forest Service lands and others on privately-owned land. Studies are under way to incorporate these into the public hunting area program. Several new small game hunting areas, primarily in and near the industrialized Piedmont section of the State are also being sought.

Establishment of these areas, and even a very modest development program on them, will require additional funds. It seems only reasonable that these expenses be borne by those who benefit. It has, therefore, been suggested that use of all Commission-sponsored public hunting areas be by permit, either daily or seasonal.

Since lack of personnel precludes establishment of check-stations on new areas, it has been suggested that a system of season permits be established for them. On the new areas, hunting for all game —big game, small game and migratory game— would require a $5.00 permit. Hunting small game and migratory game would require a $3.00 season permit. Since these permits would be restricted to Commission-managed areas, only those who use

Public Hunting Areas - 1966-67 (propose

CHECK-STATION AREAS

Existing areas — owned or leased

NON-CHECK-STATION AREAS

■ Existing areas — owned or leased

D Designated dove shooting areas (annual lease)

S Small game hunting areas (to be leased)

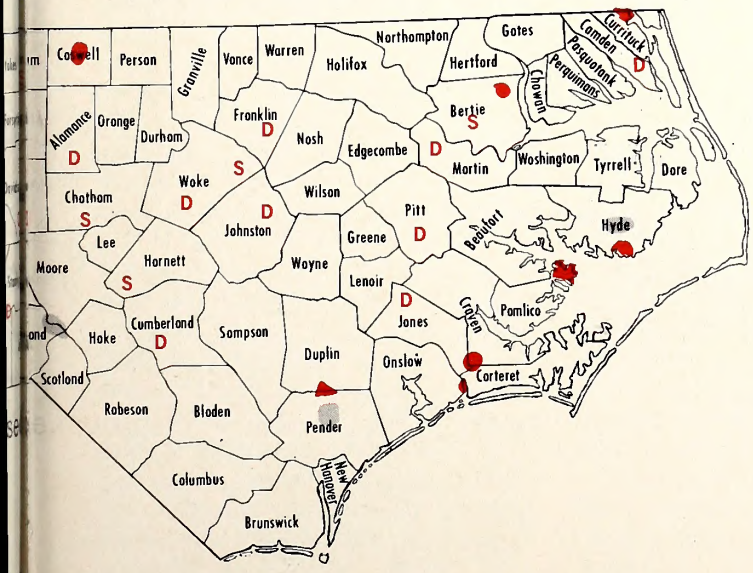
O Big game hunting areas under study

This is a checking station scene which will be repeated many times next fall. This article describes a proposed new system.

these areas would be required to support the cost of management.

Under this system we would have two types of management areas (a) areas *with* checking stations where hunting would be mostly by daily permits and (b) areas *without* checking stations where only season permits would be required. In the first category would be all but one of the present managed hunt areas. In the second category would be game lands on which permits were not required in the past—such as Caswell, Goose Creek, Gull Rock and the North Pisgah Buffer Zone—and the new small game and big game hunting areas and the designated dove shooting areas.

These proposals are to be further discussed at the public hearings scheduled for the latter part of this month. Hunters are urged to study them carefully and to convey their opinions and suggestions to the Commission.



A PROPOSED NEW LOOK IN WILDLIFE MANAGEMENT AREA PROGRAM

Permit, in addition to hunting license, required to hunt on any Commission-operated wildlife management area. Season permits for sale at all check-stations, or refuge headquarters where there is no check-station, and at license agents located near non-check-station areas.

Areas on which hunters must pass through check-station:

1. Santeetlah
2. Fires Creek
3. Standing Indian
4. Wayah Bald
5. Sherwood
6. Pisgah
7. Harmon Den
8. Rich Laurel
9. Flat Top
10. Mt. Mitchell
11. South Mountains
12. Daniel Boone
13. Thurmond Chatham
14. Uwharrie
15. Sandhills
16. Holly Shelter
17. Lake Mattamuskeet

Areas under intensive management; protection by refuge protectors; hunting by daily permit except season small game permit honored on open dates.

Areas without check-station:

1. Northwest River
2. Union-Bag Lands
3. Gull Rock
4. Goose Creek
5. Croatan
6. White-Oak
7. Angola Bay
8. Caswell
9. Green River
10. North Pisgah Buffer Zone

11-32. Designated dove shooting areas, new U. S. Forest Service big game areas, new leased big game areas, new leased small game areas

Areas not under intensive management; protection by county protectors except where near areas with refuge protectors; hunting by season permit ($3.00 for small and migratory game, $5.00 for all game); development, if any, by landowner, small game project, or big game project.

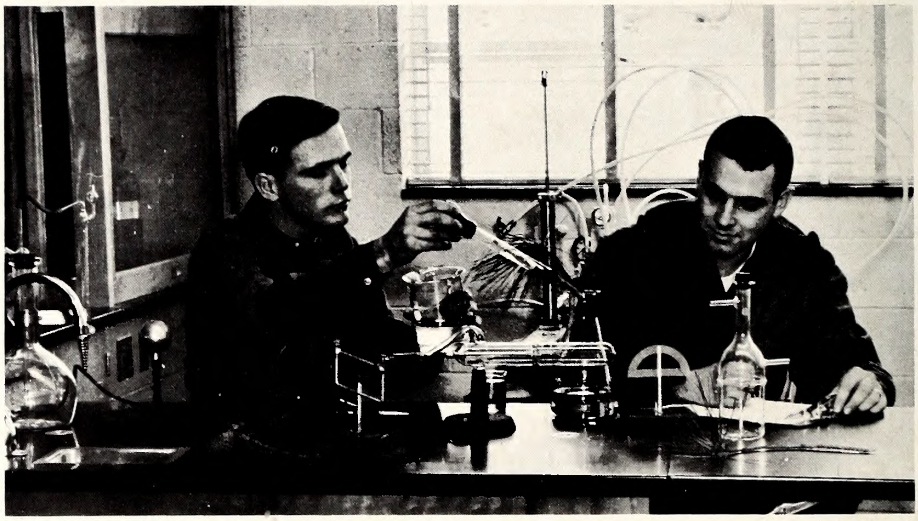
WILDLIFE MANAGEMENT AREA DEER HUNTS—1965-66*

	Archery Hunts		Buck Gun Hunts		Either Sex Hunts	
Area	Deer Kill	Hunter Days Per Kill	Deer Kill	Hunter Days Per Kill	Deer Kill	Hunter Days Per Kill
Santeetlah			49	14	23	13
Fires Creek			79	13	36	12
Standing Indian	3	66	95	17	43	16
Wayah Bald			60	14	54	10
Sherwood			122	16	69	18
Pisgah	5	77	257	20	208	11
Harmon Den			22	17	10	13
Rich Laurel			25	20	25	10
Flat Top			50	22	43	21
Mt. Mitchell	20	30	59	24	85	13
South Mountains			30	19	25	29
Daniel Boone	16	34	107	29	103	14
Thurmond Chatham	2	88	41	31	71	22
Uwharrie	25	47	94	23		
Sandhills	1	49	47	27		
Holly Shelter			58	18		
Croatan	2	33	16	17		
Totals	74		1,211		795	

*Detailed report of all management area hunts available on request.

Practical Forestry
Training Forest Technicians

by Reid Folsom
Forester, Wayne Technical Institute



The Wayne Tech forestry program provides laboratory and classroom experience of a practical nature, but also takes the student into the field where he "lives" his training. Field exercises include problems in surveying and even mountain climbing!

AT Wayne Technical Institute in Goldsboro, North Carolina outdoor-minded young men are busy preparing themselves for a career in one of the many phases of forest land management.

Forestry in the United States has progressed to the point that the professional forester no longer has as much time to spend in the woods as he used to. The supervision of various crews working in the woods, fighting fires, measuring trees, surveying, maintaining roads and trails are jobs once done by the professional forester. Now the forest technician does these things freeing the forester to better perform his more professional duties.

Wayne Tech's new school is the first two-year forest technician program in the South. These two years of training, one half spent in outdoor field laboratories, gives a young man the needed skills to be qualified as a forest technician.

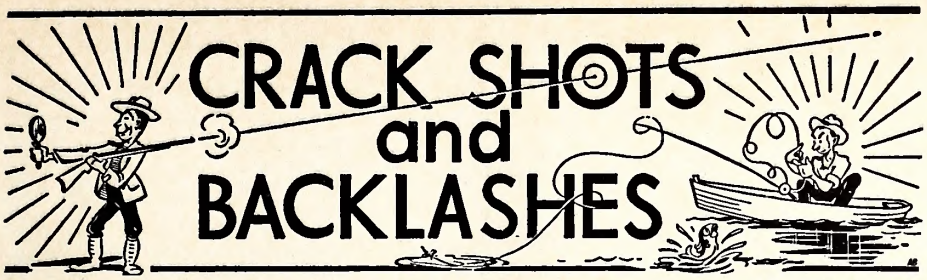
At first, the students are taught safety and woodsmanship to enable them to better live and work in the forest. Lectures and practical field exercises teach the student to handle himself in areas of adversely steep terrain, dense brushy and swampy areas as well as the usual forest areas. For one of the practical exercises, one faculty member goes into a forested area and "gets lost." The students then conduct a search and rescue operation to bring in the "lost" professor. In another beginning course tree identification is studied. After all, a man working in the woods must know his trees. Then comes botany, ecology, silviculture, timber cruising, fire control, logging, reforestation, road and trail construction. Even a course in wildlife science and one in forest recreation is included. Intermingled with these and similar forestry courses are some regular academic subjects such as English, report writing, psychology, economics and mathematics. At Wayne Tech, all courses are taught with the assumption that the student has never seen the subject before. For example, no previous math is necessary for the algebra course.

Although Wayne Tech is part of the community college system of the State of North Carolina, there are no entrance examinations to enter the forestry program. Only a high school education or its equivalent is needed. Wayne Tech believes that all young men should have a chance. If a student can meet the standards set by his professors and maintain a satisfactory grade average, he can graduate. The standards in the forestry program are high. Thus, the man that graduates will be well qualified to be a forest technician.

The forestry program at Wayne Tech offers an opportunity for those boys that are interested in an outdoor occupation but for some reason cannot enter a four-year college or cannot complete a baccalaureate degree. The Wayne Tech forestry program also appeals to the young man who is just not interested in a four year college program but would like to work in the forest.

At this time forestry is the only program offered. However, plans are under way to add forest recreation technology in 1967 and forest wildlife technology either the same year or in 1968. The over-all idea is to offer many

• continued on page 30



DEPARTMENT OF LETTERS TO THE EDITORS, FIELD NOTES, AND ITEMS OF INTEREST

Conducted By Rod Amundson

Once again Tarheel hunters will be given a voice in setting the regulations for next fall's non-migratory game hunting seasons. There will again be nine public hearings, one in each of the nine Commission districts (see "Resource-O-Gram). These hearings usually turn out to be forums, in that anyone attending is given a chance to voice his views, make suggestions, and so on.

At each of the meetings the Wildlife Resources Commission presents and explains a set of proposed regulations. These proposals are formulated after field personnel have made a thorough survey of the game population potential, and made suggestions for improvements or changes. The latter are presented to the Commission for further consideration, then explained at the public hearings. After the hearings are completed the Commission meets again to consider the suggestions made by persons attending the hearings, and to consider any other proposals or suggestions received by mail or by other means. The official regulations are established at this meeting and published in time for distribution when hunting and combination hunting and fishing licenses go on sale next August 1.

This is considered to be the most democratic means of establishing hunting regulations—the violation of which constitutes a crime. A special effort will be made this year to record opinions voiced by persons heard at the hearings so that as many as possible may be informed of the action taken with regard to their suggestions.

The "Crackshots & Backlashes" section of our magazine would be impossible to conduct without the continuing correspondence from our readers. These letters are appreciated and as many as space allows are printed. We try to keep *Wildlife* as interesting as possible to the largest possible number of our readers and at the same time make it a reflection of the policy and philosophy of the Wildlife Resources Commission and the workaday activities of its personnel.

We occasionally get letters from people who receive two or more copies of our magazine each month. People in our machine records section who handle the mailing list make every reasonable effort to forestall this, and usually when complaints of this nature are received we find that we have the same last name but two different addresses (post office box and street address) with initials in one case and first name in the other,—and no way of knowing it is one and the same person.

If you are getting two copies, let us know. We will combine them to run consecutively instead of concurrently.

Wildflower Book

DEAR SIRS: In "Crackshots and Backlashes" for last July, I noted a letter from Mrs. F. W. Wilcox concerning a need for a well-illustrated book on the native naturalized wildflowers of North Carolina. For over a year there have been plans for such a book and one is now in the early stages of organization and preparation that will portray several hundred of our species in full color.

Also, perhaps many of your readers are not aware of the "Guide to the Vascular Flora of the Carolinas" by A. E. Radford, H. E. Ahles and myself that was published in 1964 by the Book Exchange of the University of North Carolina at Chapel Hill. I enclose an announcement of this book should you want to pass some of the information to your readers who are interested in the plants of our state. C. R. BELL, ASSOCIATE PROFESSOR OF BOTANY, U. N. C., CHAPEL HILL

Safety Workers Awards

Individuals and organizations that have outstandingly contributed to accident prevention will be honored at the Sixth Annual Awards Program of the North Carolina Rural Safety Council. The May 6th Awards Program will be held in Winston-Salem at the Robert E. Lee Hotel.

The North Carolina Rural Safety Council was created by farm leaders, physicians and public agencies engaged in safety education and promotion to coordinate and promote rural safety programs. The Council cooperates with national, state and other organizations, both public and private, having expressed interest in the promotion of safety among rural people.

In the past, Wildlife Protectors have been among those awarded in the field of gun and water safety achievement.

Boat Sewage Treatment

In reference to a recent amendment to North Carolina's Boating Safety Law, Chapter 75-A of the General Statures, which requires sewage treatment or holding tanks on boats operating on inland lake waters which use marine toilets, the Wildlife Resources Commission has been informed by the State Board of Health that the Figure 6000 'Seaclo' Chlorinator has been found to be acceptable as a sewage treatment device. The 'Seaclo' is manufactured by the Wilcox-Crittenden Division of the North and Judd Manufacturing Company, Middletown, Connecticut. This equipment should be available through most marine supply outlets in North Carolina.

What Are They?

DEAR SIRS: The eye-catching cover of your March, 1966 issue was accompanied by a paragraph that has greatly aroused my curiosity. As a native New Yorker I expected to see many of these "Solid Citizens" on the coast of North Carolina. When I first arrived in the state a few years ago, however, I was quickly convinced

KNOW YOUR PROTECTOR

Clay V. Clark

Clay V. Clark, Rowan County Wildlife Protector, was born on June 6, 1931, in Davidson County. He is the son of Mr. and Mrs. C. C. Clark of Lexington, North Carolina. Mr. Clark graduated from Lexington High School. Prior to employment with the Wildlife Resources Commission, Clark was employed by the City of Lexington.

Clark completed the Pre-Service Training School for Wildlife Protectors at the Institute of Government in Chapel Hill in 1961. In November, 1961, he was assigned to Mecklenburg County as a Protector Trainee. In January, 1962, he was appointed Wildlife Protector, and in July transferred to Rowan County. Since his initial employment, he has completed five In-Service Training Schools.

Mr. Clark is a member of the Masonic Lodge No. 473 in Lexington; the Southeastern Association of Game and Fish Commissioners, Law Enforcement Section; Rowan County Peace Officers Association and Buck and Doe Wildlife Club of China Grove. He is married to the former Jacqueline Sink of Lexington, North Carolina, and they have two children, Kathy, age 13, and Keith, age 11. The Clarks are members of Fairmont Presbyterian Church, Lexington, North Carolina. They are presently attending the Mt. Moriah Lutheran Church in China Grove.

DIVISION ENFORCEMENT RECORD FOR FEBRUARY, 1966

HUNTING & FISHING	
Persons checked	8,366
Total prosecutions	148
Total convictions	135
Total cases not guilty	4
Total cases nol prossed	9
Total cases dismissed	0
Total fines collected	$1,368.90
Total costs collected	$1,126.15
BOATING	
Boats checked	336
Total prosecutions	18
Total convictions	18
Total cases not guilty	0
Total cases nol prossed	0
Total cases dismissed	0
Total fines collected	$34.40
Total costs collected	$111.70

All fines and any arrest or witness fees are paid into the school funds of the counties in which the violations occurred, and no part of the fines or costs collected are paid to the North Carolina Wildlife Resources Commission or its personnel.

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that no such creatures survive in this state by several friends of mine who live on the coast and who laughed rather cruelly at me when I asked about them!

I am also now under the impression that they do not come this far north due to the comparatively severe winters. Not long ago, I tried to convince another New Yorker that there are no alligators in North Carolina, but I'm afraid that I did not succeed. A small reptile and amphibian reference book that I have indicates by a colored-in map that they do not live this far north.

Please help me settle a long-standing and most irritating question once and for all. Is the alligator really a "solid citizen" of this state or are there just a few remaining? Also, can you tell me approximately where they might be found? I really would like to believe that there are plenty in this state and am glad to hear that they are now protected by law.

Thank you for your time and consideration. MRS. W. G. RHODES, CHAPEL HILL.

Yes, Ma'm, there *are* alligators in North Carolina. They have become so scarce in recent years, due to the commercial value of their hides, that the 1965 General Assembly placed them under rigid protection.

They occur in the southeastern section of the state, but probably do not occur farther north than Tyrell County. If you go to Wilmington this spring for the azalea festival, visit the Orton Plantation. Very likely you will see a 'gator or two in the rough and in the wild.—Ed.

Forestry

• continued from page 28

programs based on the forest land resources. A young man can then specialize in one field and take elective courses in another field that interests him. Thus a better understanding of multiple use management can be obtained.

The potential jobs in forest recreation are just being realized. The great surge to the out-of-doors is placing new demands on the forester. A technican specifically trained in recreation is vitally needed on the public forester's staff. In the near future wildlife is expected to follow the same trend.

The forestry program is quite fortunate in having adequate field equipment for instruction in the technical fields. In addition there are several trucks, a jeep, and a portable sawmill. Classes are held on Wayne Tech's Goldsboro campus and the labs are held in nearby forests. Private forest industries, citizens of the county, the State Forest Service, and the Division of State Parks have made available some 6,500 acres of land for these outdoor laboratories.

Suggested reading:

"Birds' Nests—A Field Guide" —Richard Headstrom
Ives Washburn, Inc., N. Y.—1949

"Birds in Their Homes"—Addison Webb
Garden City Books, Garden City, N. Y.—1947

"The Cradle Shall Rock"—Jean George
Reader's Digest—April, 1961

"Nature's Noisy Chiselers"—Peter Farb
Reader's Digest—Sept., 1962

"Some Fine Feathered Friends"—Don Bleitz
Reader's Digest—May, 1964

Wild Flower Chart

Rustic Name	Genus	Family Name	Blooming Season	Flower Color	Habitat	Remarks
Alumroot	Heuchera	Saxifragaceae (Saxifrage)	Spring	Pink Yellow	Rocky woods, acid soil	Roots used as medicine
Adder's Tongue	Erythronium	Liliaceae (Lilly)	Spring Summer	Yellow Violet	Moist woods, mountains	Edible corm; mottled leaves
Blue Flag	Iris	Iridaceae (Irish)	April May	Lavender Blue	Meadows, marshes	Leave plenty for propagation
Bouncing Bet	Dianthus	Caryophyllaceae (Pink)	Summer	Pale Pink	Sunny slopes, wastes	Juice lathers in water
Bunchberry or Cornel	Cornus	Cornaceae (Dogwood)	May June	White	Rich, moist acid soil	Berries in fall
Butterfly Weed	Asclepias	Asclepiadaceae (Milkweed)	Late Summer	Orange Red	Fields, woods, roadsides	Plentiful in N. C. Watery sap.
Culvers-Root	Scrophularia	Scrophulariaceae (Figwort)	Summer	White	Damp thickets, fields	Fernlike leaves
Crinkle-Root	Dentaria	Cruciferae (Mustard)	Early Spring	White Pink	Woods	Fleshy under-ground stems
Eastern Columbine	Aquilegia	Ranunculaceae (Crowfoot)	May June	Red Yellow	Woods, shade, rocky soil	Attractive to Hummingbirds
Lupine	Lupinus	Leguminosae (Pea)	Spring Summer	Blue	Hillsides, open fields	Best grown from seed
Meadow Rue	Thalictrum	Ranunculaceae (Crowfoot)	Summer Fall	Green-Purple	Wet thickets, meadows	Fluffy flower, fernlike leaves
Scarlet Wild Bergamot	Monardo	Labiatae (Mint)	Summer	Red	Moist woods, roadsides	Leave plenty; Hummingbirds
Snow-on-the-Mountain	Euphorbia	Euphorbiaceae (Spurge)	Summer Fall	Green-white	Dry grasslands	Plentiful for gardens
Spring Beauty	Claytonia	Portulacaceae (Purslane)	Spring	Pink White	Open woods, part shade	Don't disturb roots. Edible.
Starry Champion	Lychnis	Caryophyllaceae (Pink)	Summer	White	Moist fields, wastes	Fringed flowers
Tall Bellflower	Campanula	Campanulaceae (Bellflower)	Summer	Violet, White	Woods, marshes	Leave plenty; Conserve.
Turkscap	Lilum	Liliaceae (Lily)	Summer	Orange Red	Meadows, wet ground	Pick only in countryside
Twinleaf	Berberis	Berberidaceae (Barberry)	April May	White	Rich, shady Woods	Practice conservation
Cranesbill	Geranium	Geraniaceae (Geranium)	April July	Purple Rose	Woodlands	Seeds for birds; Leave plenty
Wild Sweet William	Phlox	Polemoniaceae (Phlox)	Spring	Violet	Woods and meadows	Pick only when clearing land

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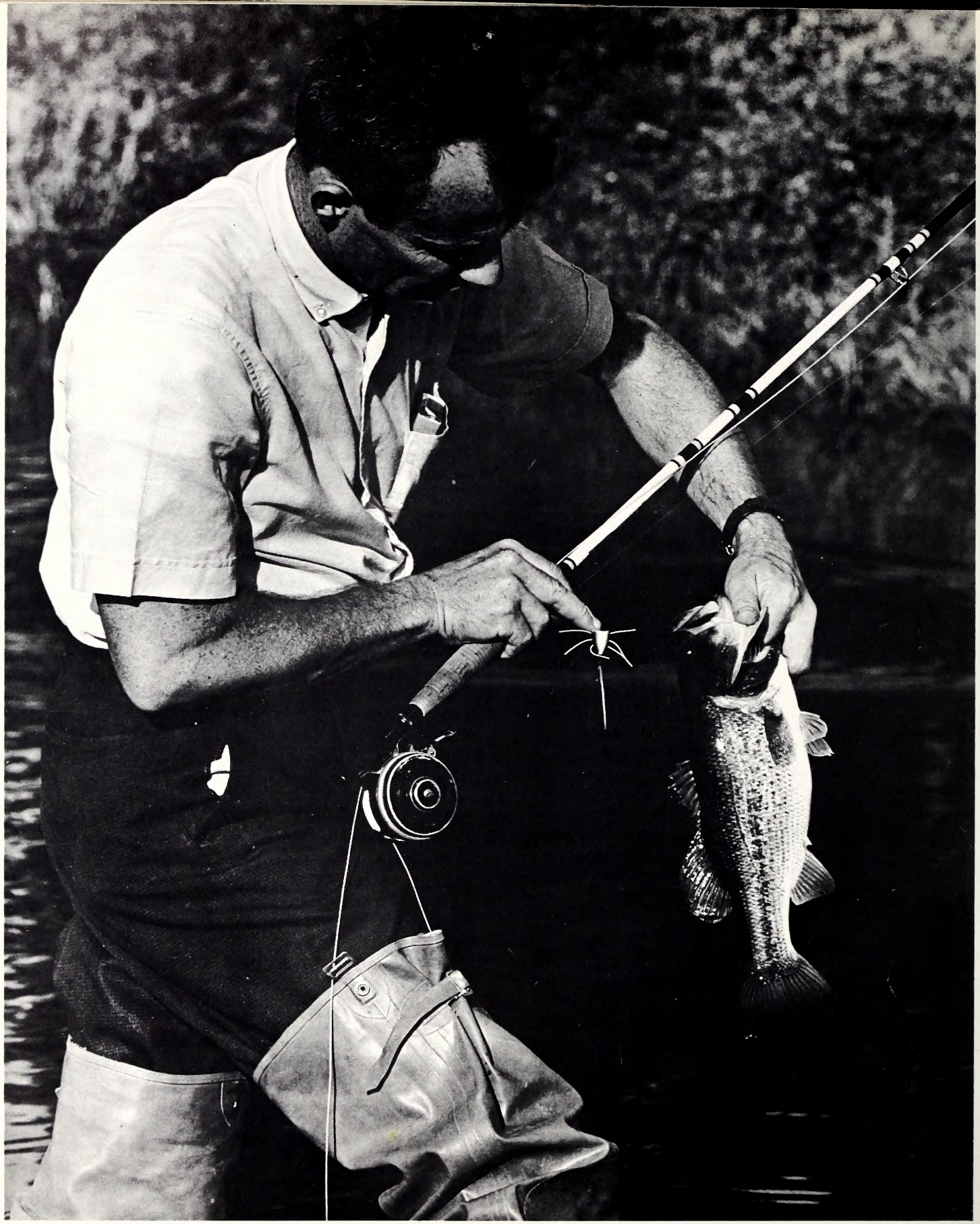
Wildlife IN NORTH CAROLINA

JUNE, 1966



JOEL ARRINGTON

ON TOP

If there is a more exciting way to catch largemouth bass than on a popping bug and fly rod, we would like to hear about it. This two-pounder fell for a rubber-legged creation fished near the shoreline by a wading angler. Evening hours may be best.

North Carolina State Library
Raleigh

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WILDLIFE IN NORTH CAROLINA recognizes the need for close cooperation between State and Federal conservation agencies and the people who hunt and fish—to bring about a restoration of our renewable resources. The Editor gratefully receives for publication news items, articles, and photographs dealing with the North Carolina out-of-doors, but reserves the right to reject materials submitted. Full credit is given for all materials published.

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JUNE, 1966 VOL. XXX, NO. 6

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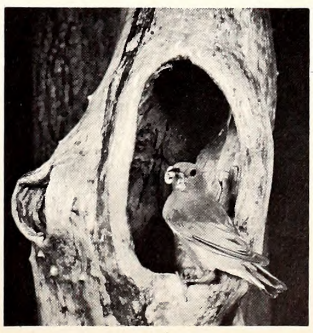
JOHN PARKER - - - - - OUTDOOR SAFETY
TOM JACKSON - - WRITER-PHOTOGRAPHER

A summer resident of eastern North Carolina, the prothonotary warbler provides a brilliant dash of color to the swamps and slow-moving rivers around which it makes its home. Pictured here is a male with a tender morsel for the young in the nest cavity of an old tree. The female is similar in color to the male but has olive-green on the top of its head as well as the back. Transparency by Jack Dermid, Wilmington, N. C.



Chemicals and Wildlife

by Luther Partin

THE application of science to agriculture in this country has produced an abundance of food and fiber unknown to any other nation at any time in recorded history. The remarkable thing about this great technical achievement is that most of it took place in the relatively short time of about two generations.

Before giving too much credit to science, we must acknowledge that only the friendly atmosphere of a free competitive society can foster the conditions that make this kind of progress possible. The American farmer has become so productive that governmental controls on crop production have been imposed in an attempt to keep the supply in line with the demand. But farm production keeps increasing, invoking dismay from our own government and envy from the rest of the world.

Coincidental to this explosion in food and fiber production has been an increasing dependence by agriculture upon chemicals to control insect pests. While it is difficult to completely define the economic importance of chemicals in agriculture today, it is even more difficult to measure their long range danger to animal health. Chemicals developed to kill "pest-type" animal organisms are also capable of killing higher animals and man himself.

Certainly research in the field of pesticide residues has lagged far behind the experiments. Well over 40 million acres of agricultural land are treated annually with one or more basic types of technical materials. The number of materials now available is about 500. These chemical compounds are mixed by some 8,000 manufacturing firms to produce over 60,000 formulations registered for use as pesticides.

Aerial spraying with insecticide is effective for large areas, but must be done carefully. Modern bug killers can be lethal to many forms of wildlife. These fish were killed by field runoff.

A seemingly innocuous method of controlling certain soil insects, by mixing pesticides with fertilizer, has been used for many years. This service was instituted by fertilizer manufacturers at the request of farmers. While fertilization and insecticide application are normally carried out at different times, this procedure was employed to get two jobs done at once for the sake of economy.

On the surface it would appear that insecticides applied in this manner present no danger to animal life except the cutworms, wireworms and such that might be in the treated area. The Patuxent Wildlife Research Center at Laurel, Maryland, has sponsored studies showing that even this method leaves residues that can be a threat to wildlife. For example, one year after an application of two pounds per acre of aldrin to a corn field, the soil averaged 0.36 ppm (parts per million) of dieldrin (aldrin soon changes to dieldrin after application), a compound that is very stable in the soil. This may not sound ominous, but the earthworms found in this same soil averaged 3.6 ppm, a residue concentration ten times that of the soil.

What will be the effect on wildlife species, such as robin and woodcock, that feed extensively on earthworms? Research at Patuxent indicates that they would die if subjected to a constant intake of worms containing this level of dieldrin, while occasional feeding would have little direct effect. Patuxent workers have kept bobwhite quail for years on a diet containing 4 ppm of dieldrin without losing any birds. Resistance may vary from one wildlife species to another, but the problem may be

compounded by several residues picked up from different parts of the environment.

Dr. E. H. Dustman, Director of the Patuxent Center, poses these questions: Does a wildlife species keep building up a residue concentration, with residues of one pesticide added to those of others? Or do they have time to get rid of pesticides faster than they pick them up? He points out that both conditions are known to occur and are probably common, depending on the prevalence of contamination in the region and on the food habits of the animal.

Patuxent workers conclude that soil applications of persistent insecticides lead to widespread contamination of the environment. Residues in local food organisms, such as slugs and worms may cause a slow, scattered mortality of especially sensitive forms of resident wildlife. Even though dieldrin is very persistent in the soil, a substantial percentage is lost each year, chiefly to the air, and comes down in dilute form over vast areas. Hence dieldrin can be found in almost any aquatic food chain today, with 1-4 ppm being commonly found in eagle and osprey eggs.

AT least one state, Arkansas, has recognized the need for regulating the use of chemicals. The concern here is over the damage caused by herbicides used in weed control. The Arkansas State Plant Board received a record number of complaints in 1965 concerning damage to crops from applications of herbicides in adjacent fields. In most cases the complaints charged that herbicides sprayed on rice fields drifted onto neighboring farms and damaged susceptible crops such as cotton and soybeans.

The Arkansas Plant Board now requires invoices on herbicide sales or shipments from the manufacturer or distributor, an increased financial responsibility of custom applicators up to $10,000, and tighter rules for individuals wishing to obtain authority for ratings as a pilot or applicator-in-charge.

The Arkansas Board is also authorized to place a "restricted" designation on hazardous herbicides and to specify application methods as well as conditions under which the chemicals can be used. Clearance will have to be obtained for the use of aircraft or machinery previously used to apply hormone-type herbicides. Records of applications, signed by the owner of the treated crop, will have to be kept in duplicate.

A new, nationwide program to monitor pesticide residues in people, as well as fish and wildlife, food and feed, and soils and water has been approved by the Federal Committee on Pest Control. Fish, birds and mammals have been under study for pesticide residues for several years, but this will be the first time that the general human population has had regular pesticide checks.

The studies will deal with chlorinated hydrocarbon residues (DDT, aldrin, dieldrin, heptachlor, chlordane, etc.) in three groups of people; urban residents with limited exposure to pesticides; rural dwellers with repeated nonoccupational exposures; people experiencing potentially high exposures, such as applicators, formulators and greenhouse workers.

The U. S. Public Health Service will make 1,950 analyses for residues in humans each year. The samples will consist of 2.5 grams (less than one-tenth of an ounce) of fatty tissue taken from any part of the body.

The new monitoring program is designed to gather as much information as possible from a representative sampling of animal life from representative locations at representative times. The program's objectives are to determine the extent of pesticides levels in the United States and to detect any increases or decreases that may occur in the future. This type of information is essential for the protection of human beings and other beneficial life forms against possible pesticide hazards.

Regulatory agencies are concerned about the present methods of handling toxic pesticides in the same manner as fertilizer materials, instead of exercising the same cautionary measures that are applied to other products that represent a potential danger—guns, ammunition and dynamite, for example. Anyone with the money (or credit) can buy these lethal chemicals (and who will say nay), regardless of whether he can understand, much less read, the instructions regarding rates, methods of application or the danger involved.

IT is interesting to note the action taken by the State of Arkansas in regulating herbicide usage and the program of the Federal Committee on Pest Control to evaluate the residue situation. We have a natural dislike for controls and regulations, but historically we have asked for and honored them when the danger was clear and self-regulation did not work. Are we approaching this point in the manufacture, distribution and use of pesticides?

We need to know more about the extent and the significance of pesticide residues. What are the levels of tolerance for different forms of life? Can these levels be determined before some wildlife species get into real danger? These are but two of many questions that need answers.

Most research in pest control today is directed toward finding methods that provide control with less dependence on chemicals. Biological methods can replace pesticides in controlling mosquitoes and certain other pests. Sterilants are effective in some cases; cultural practices can be effective in reducing over-wintering populations of insects. Sanitation alone does wonders in controlling some pests. Future pesticide control methods will probably incorporate one or more of the above factors with limited application of pesticides of low toxicity and short duration.

In the meantime, everyone from the manufacturer to the applicator should be concerned about the present situation. When the decision is made to use a pesticide, considerable thought should be given to the choice of material, its toxicity and persistence, the time and method of application, and the minimum quantity that gives the needed control. ⬍

U. S. DEPT. OF INTERIOR, FISH AND WILDLIFE SERVICE

Ducks to Spare?

by C. E. Addy
Atlantic Flyway Representative
Bureau of Sport Fisheries and Wildlife

IN this day and age of restricted bag limits, short seasons and drained and dried up potholes could there possibly be ducks to spare? My answer is a qualified "yes". I'm hedging on the "yes" because the answer to this question depends so much on the attitudes and abilities of people, particularly the duck hunter himself. At any rate, let's take a look at the facts as we know them and perhaps we can decide, at least in our minds, whether or not there could be more opportunities for duck hunting than we have taken advantage of in the past.

There are over 40 species of ducks in the United States and Canada. However, out of all this wealth of species five alone supply close to 70 percent of the kill in the United States. These are the mallard, pintail, widgeon, green-winged teal and wood duck. If we add the black duck the total would approach 75 percent. In the Atlantic Flyway the black duck, mallard, wood duck, ring-necked duck and green-winged teal make up close to 70 percent of the legal kill. Species composition may vary between years but generally speaking two-thirds to three-fourths of the kill has been supplied by five or six species.

How Many Ducks Are There?

By means of breeding ground surveys, kill surveys and banding, game biologists have been able to estimate approximately how many ducks there are of the species favored by hunters. Back in the mid-1950's, when duck populations were at their peak, continental game ducks (species favored by hunters) numbered nearly 120 million at the beginning of the fall migration. In recent years the fall flight has been in the neighborhood of 40-50 million. These figures do not include such groups of species as eiders, scoters, mergansers, and the old squaw duck. Most of these latter species are known as sea ducks. They are heavily hunted but are believed to total several million in number.

The mallard, of course, is the number one game duck of the continent and the success or failure of a hunting season in most parts of the nation is determined to a significant degree by the abundance or scarcity of this fine bird. Unfortunately, in recent years the mallard population has reached the lowest level on record, being only about a third of the peak reached in the mid-1950's. During the 1958 season, hunters in the United States and Canada actually killed and crippled more mallards than were present in the total fall flight in 1962. In the Atlantic Flyway, as contrasted to the other three flyways, the mallard is edged out of first place in the kill by the black duck or black mallard as some of us are wont to call him.

The ducks we like to hunt the most have a pretty rough time shucking out enough young birds every year to meet the demand. Not only are they bagged rather heavily during the hunting season, but a major share of them choose to nest in the pothole country of southern Canada and the north central states. This is a semi-arid part of the continent that experiences severe drought periodically. And when the water dries up, duck nesting dries up too. It is obvious that if hunting is skimming off most of the "surplus" birds when breeding conditions are at their best then the kill has to be reduced with due speed when the potholes start to dry up. Otherwise the "capital stocks" dwindle at an alarming rate. Conversely, as potholes fill up again, the kill regulations have to be relaxed with due care to be sure there are enough breeders returning to take full advantage of the renewed nesting habitat. Although there is an old frontier saying that all one needs for a prairie dog town is one prairie dog and the prairie, one duck and a pothole do not pro-

In this era of dwindling duck populations, here's some food for thought in another direction.

duce flights which satisfy a couple of million hunters.

Does Hunting Have Any Effect On Duck Populations?

It sure does—with some species. Not too many years ago it was generally assumed that the gun really had little influence on duck population levels. It has been demonstrated that with most upland game species, such as grouse and quail, the hunting kill in the fall has little or no effect on the number of birds surviving to breed the following spring. But with migratory ducks things are quite different.

Let's consider some of the most popular species such as the canvasback, mallard, ringneck, redhead, pintail and black duck. During late August and early September in Canada, the broods begin to gang up on lakes, rivers and big marshes as soon as they can fly. Then along comes the opening of the gunning season in Canada, about the middle of September. Some of the birds that survive the initial onslaught will migrate on to the southland. But most will not start southward until later, usually in time to catch the opening of the hunting season in the northern states. And so it goes on down the line to the southern states. In other words, ducks are subjected to a continuous hunting season from the middle of September to early January. Some groups of birds miss a lot of hunting pressure by migrating to the southland early. But others who migrate in a more leisurely fashion experience several "opening days" by the time they reach their wintering areas.

A long gunning season wouldn't have such an effect if it weren't that ducks are restricted to aquatic habitats and congregate on limited water areas where hunters can get at them without too much difficulty. This, together with the fact that ducks can be tolled by block decoys and calls, makes the birds highly vulnerable to shooting.

Is Species Management A Way To Get More Hunting?

There is a bottom to the duck barrel. With some species, such as the mallard and canvasback, we have come mighty close to scraping the barrel bottom, at least as far as numbers to hunt is concerned. The number of ducks available for hunting is limited or finite. The potential number of people who would like to hunt ducks, if conditions were to their liking may not be infinite but it certainly would be more than the present resource could support. One of the jobs of the people responsible for the management of the waterfowl resource is to maintain the highest species population levels possible and permit as wide a participation in the sport of wildfowling as practical. Man can do a lot to encourage increase in duck populations but, more often than not, Mother Nature holds the key to this. On the other hand, when it comes to divvying up the birds among the hunting fraternity it would seem that man should be able to call the shots pretty well. In other words, when it comes to taking the harvest, the game administrator could devise methods which would be real conservative, resulting in a harvest by the hunter of only part of what is available to be taken. Or, he could push more efficient methods which would allow the hunter to take most of the available "surplus" and perhaps at the same time make it possible for more hunters to participate.

Information resulting from banding, kill surveys and other investigations indicates many possibilities which might supply additional hunting recreation if we took advantage of them. For example:

Some species such as the mallard, canvasback and black duck are subjected to very heavy shooting pressure and the administrator has to be careful that the kill on these species is kept within bounds. On the other hand, the greater and lesser scaup and the mergansers and sea ducks are very abundant and not heavily shot. Here are opportunities for increased hunting recreation if the means could be found to get greater participation by hunters without increasing the kill of species already harvested to the limit.

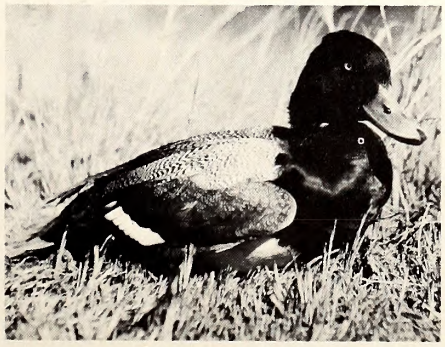
Even for some of the most heavily-shot species there are what we might call sub-populations which, for one reason or another, escape heavy hunting pressure. For example, mallards in the Columbia Basin of Oregon, Washington and Idaho, and black ducks wintering along the Massachusetts coast are lightly-shot in spite of the fact that the overall continental population comes close to being overshot. More liberal regulations could be permitted in such local situations as these although restrictive regulations would be necessary elsewhere.

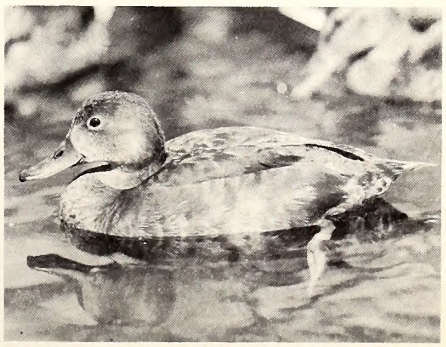
Because of early migration some ducks, such as the blue-winged teal and some pintails, escape a lot of shooting pressure. These populations could undoubtedly withstand additional hunting pressure but the hunting would have to be earlier than usual and probably restricted to special areas where other species wouldn't be jeopardized.

In some species, particularly those of the diving duck group, drakes greatly outnumber hens. It is believed that a harvest of some of these "extra" drakes would do no harm to the population, whereas little or no re-

Perhaps species such as the scaup (drake at left) can stand even greater harvest, while many others (redhead, right) can't.

FISH AND WILDLIFE SERVICE





duction in the number of hens could be tolerated. For those species in which the male is contrastingly colored and readily distinguishable from the female, as in the canvasback and perhaps even the mallard, "drake only" shooting might be feasible.

Since the various duck species migrate at different times and traditionally congregate at different locations while enroute south, special regulations may be possible for certain areas and at specific times during the fall. For example, if certain well-defined lakes or marshes harbor the bulk of a species in short supply, these areas might have very restrictive regulations whereas the rest of the state (or flyway) could have more liberal regulations.

Also, in order to allow increased hunting on some species and restricted hunting on others, it might be desirable to delay the opening date or start earlier, depending on the situation. Approaches such as these offer possibilities where the critical species is difficult to distinguish from other more abundant species. Such a situation is involved in the bonus scaup regulation wherein the similar-appearing ringnecked duck cannot be included in the bonus. In this instance, the bonus regulation this past season (*Wildlife*, November, 1965) applied only to certain areas and was not permitted to take effect until November 15 (after the ringneck had departed the northern states in the flyway).

We, The Duck Hunters, Hold The Key!

The administrator's job is not easy because there is as much or more "people management" involved as there is duck management. His problem is not only to maintain duck populations at a high enough level to allow shooting, but to figure out how many birds can be taken and how best to distribute this harvest equitably among the hunters. It sometimes seems that anyone who can figure out a practical way to obtain a maximum allowable harvest of all species without ending up with a set of impossibly complicated regulations must be a magician.

Species management is not new. We have been doing it for many years. We've had closed seasons on canvasbacks, redheads and other species. We've had one and two bird limits on wood duck, hooded merganser and other species. And we even have permitted bonus bags for some species in some areas. Most of these regulations have worked satisfactorily in that they accomplished what was intended. But to go much further with species management than we already have, real complications could develop.

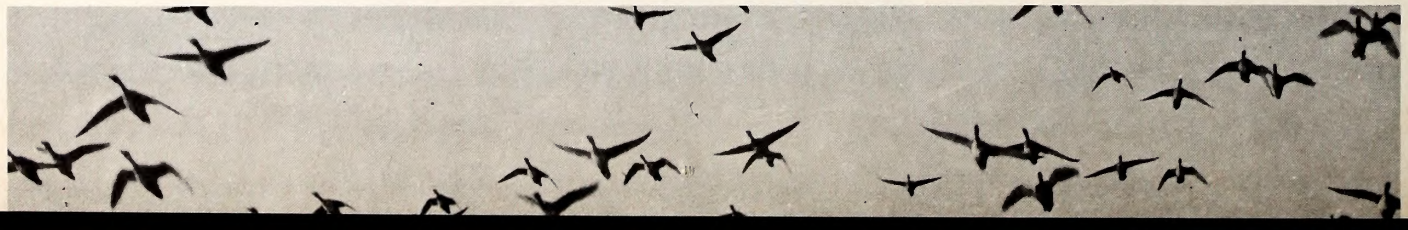
In the past, species regulations generally have been restrictive rather than relaxed. The reason for this is that when there is a difference in bag limits among species some critically scarce species may get shot too heavily whether intentionally or unintentionally. In other words, if hunters can't distinguish a species that is critically low in number from other species when they occur together, then management authorities must take the conservative approach and regulate on the basis of the welfare of species in short supply. Administrators of the resource are obligated to consider the needs and welfare of all species. Managers cannot be guided solely by the over-all number of ducks available nor only by the status of the most abundant species. For example, it wouldn't be good management to let the canvasback or mallard pass out of the picture just because there were plenty of scaup and other species anyway.

Whether or not we can squeeze out more hunting recreation per duck obviously depends a lot on the ability and attitude or the wishes of the duck hunter himself. To get more shooting from the same number of birds the duck hunter is going to have to know his ducks and abide by the rules of the game. Furthermore, his actions should be governed by a conservative approach wherein he will take it upon himself not to shoot under conditions which promote illegal kills and lost cripples. Each duck counts and a duck lost is a duck less for somebody else. And lastly, the duck hunter must accept the fact that regulations in one part of the flyway may have to be different from those in another in order to take advantage of differences in the duck populations.

Whether we can get more duck hunting in the future with the same number of ducks we have today depends, as you can see, on a whole host of "ifs" and circumstances. In any event, whatever regulations are devised they must be practical and possible of execution under actual field conditions. A lot of bright ideas look good on paper but for one reason or another obviously wouldn't work in actual practice. An important point to keep in mind is that duck hunting is for fun. But if efforts are made to hunt the last available duck and give everybody a chance, hunting could become so regimented and so regulated that enjoyment of the sport would be ruined for everyone. It's really no crime if some ducks get by "unshot" and some potential duck hunters play golf instead.

Errors in judgment and misunderstanding can be held to a minimum if a close working relationship is maintained between the duck hunters and the state and federal game authorities. In this way the duck hunter can keep himself better informed and gain a better appreciation of his responsibilities. The administrator, on the other hand, will better understand field conditions and will be in a better position to make rules and regulations which will best serve both the desires of the hunter and the needs of the resource.

Species management may be necessary for better duck hunting.



Conservation in Action

Mt. Pleasant Wildlife Club

How's your club doing? From time to time, Wildlife will present sketches of club activities which it learns about.

AT a winter meeting, the Mt. Pleasant Wildlife Club presented two annual awards for conservation achievements. Giles Kindley received the outstanding member award for his contributions to wildlife conservation in Cabarrus County. Kindley's greatest accomplishment to wildlife management was in planting food and cover on different farms in the area.

The second award, presented to the most deserving Eagle Scout in the county, went to Eagle Scout Tate Nabors, Jr. Nabors possesses all the conservation merit badges offered by the Scout Council—soil and water conservation, wildlife management and forestry. His contributions to wildlife management consisted of constructing squirrel boxes and assisting younger Scouts in earning merit badges. Nabors is also holder of the Bronze Palm.

One of the objectives of the Club since its beginning three years ago, has been to create better public relations between the farmers and hunters. In addition they have preserved and produced more game for local hunters. Land has been leased and furnished to the State for public dove hunting areas.

Newly-installed president Archie Smith stated, "The next step and especially the biggest one to be made by the club is the sponsorship of a 4-H Junior Wildlife Club. Kenneth Beam, Wildlife Protector of Cabarrus County and E. E. Bishop, County Extension Chairman, are in charge of the organization of the Junior Club."

The Club has recently appointed a Committee to investigate the possibility of erecting a skeet shooting range so the hunter may have an opportunity of sharpening his shooting eye during the off season.

Officers elected for the coming year are:

J. Archie Smith, President; M. D. Swaringen, first Vice-president; Harold Moose, second Vice-president; Norman Simms, Secretary-treasurer.

Committees named are:

Program—O. W. Clayton, Chairman; Kenneth W. Beam, Lawson Foil

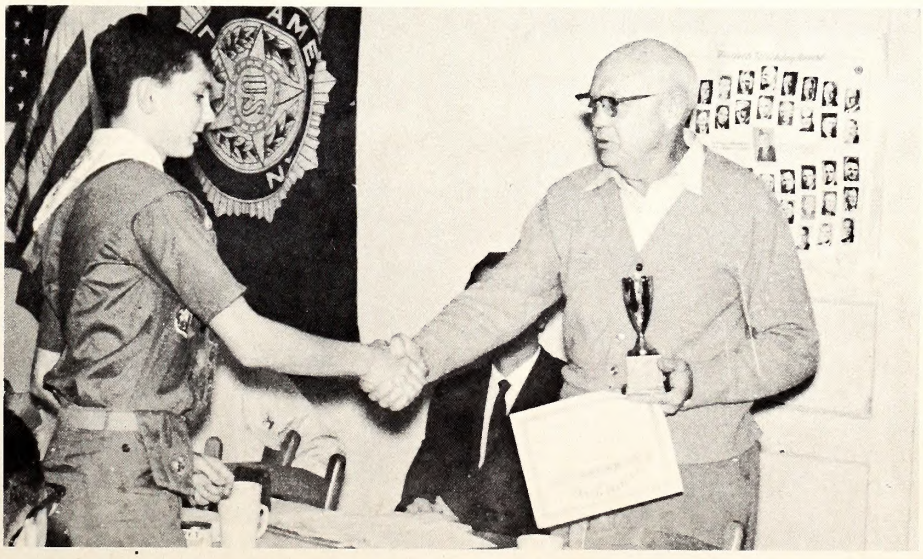
Food—D. W. Coley, Chairman; Vester Ritchie, Vice-Chairman

4H Junior Wildlife Club—William Honeycutt and Harvey Lee Barringer, Co-chairmen; Giles Kindley, John Fink, Norman Simms, Harold Moose, E. B. Causby, Lawson Foil, Kenneth W. Beam.

Membership and Public Relations — M. D. Swaringen, Chairman; Bob Dove, J. F. Hahn, Jr., William Kindley, J. S. Haskins.

Management — R. J. Barringer, Chairman; Harvey Lee Barringer, William Honeycutt, John Fink.

The Mt. Pleasant Wildlife Club's annual Outstanding Member Award is presented by past president O. W. Clayton to Giles Kindley. Below, the club's annual Scout award is presented to Eagle Scout Tate Nabors for outstanding work in conservation.



For Bass, Get to the Point!

by Frank Mooney

ARTWORK AND PHOTO BY DUANE RAVER

THE leadhead jig had traveled only a couple of feet from the submerged bush when it was stopped by an arm-jolting strike. I let the pugnacious bass mouth the plastic worm, then with a quick jerk drove the hook home. When a hard-hitting largemouth catches the angler relaxed, it can actually hurt the angler's arm with the fast, hard strike. The drag cried in anguished protest, the surface erupted sending drops of water into the air as the wild fish shot for the brush and any tangle that would tear out the hook. Over excited from the early action, I yet managed to snub the leaping fish at the fringe of freedom. The bass quickly swapped ends turning to the left and tearing out to deep water off the point. Changing tactics, the tiring bass was about to jump again for I could see more of the line as it surfaced. Punching a hole in the surface as it catapulted, shaking and flaring the bright red underpart of its gill cover, the largemouth spiraled to my left and the black plastic worm shot ten feet in the air to my right. After several short runs it lay in the boat flopping. It always seems that these wild Kerr Reservoir bass outfight and outpull their small lake and private pond cousins.

Bass, bushes and points are companions in Kerr Reservoir in late spring and early summer. They go together like peaches and cream when the water is backed into the bushes and the temperature is hanging in the lower 70s. When largemouth are seeking forage fish they generally can be caught on the brush-sprinkled points. As a rule, the smaller bass are caught in only inches of water with the trophy lunkers located farther out on the points. Sunken islands and brushy islands are also major feeding grounds for the lunkers.

After talking with several experienced anglers that fish this lake, I have reached the conclusion that the bass prefer the points and islands. Gizzard shad are the main forage fish for the largemouth. These gregarious shad are shallow water lovers, so naturally the bass will be found near their essential needs. Points and islands have the quick access to deep water along with their dining facilities. For the bass, food and shelter are of primary concern.

One cool June morning this past season, Bill Zimmerman and I left Roxboro at five a.m. for Kerr Reservoir. Bill said Butchers Creek was a good place to launch the boat because he didn't catch all the bass his last trip. With 50,000 acres Kerr has a large number of brushy points to choose from. Although I have caught bass on a large portion of the lake, I wouldn't venture to say which part produces the most fish. About 6 a.m. we loaded the boat and headed for bass, bushes and points.

It's wonderful to witness a new day begin on any large lake. As the eastern sky reddens and streaks of clouds change to a pinkish hue with wildlife waking and joining in with their good-morning song. You get the feeling that the animal and fish kingdom is better off than the frustrated human world. Most likely at this time the wind is calm and the splash of a fish carries an unbelievable distance as they cavort and churn the water trying to catch their breakfast.

Take great care in approaching a point and be careful about items such as anchor and oars banging against the boat. Cut the motor when approaching thus keeping waves to a minimum. When fishing the points we usually ease within casting distance, cast several times; if no luck, continue to another point. Get only close enough to cast effectively, the bass are hungry but their hunger pains don't over rule their wary nature. Sometimes the bass have to be worked up before they will strike, like continuously casting on the same point; but this usually yields fewer fish. If the wind is calm, two anglers can work a point satisfactorily before the boat drifts beyond casting distance. Anchoring takes up time that can be used for fishing and usually will not help to put more fish in the boat except on rare occasions.

The wind was calm, so with the

These "point" bass fell to a floating-diving plug. Maybe you'll get a bigger one!

paddle I eased the boat within casting distance. Bill had a hard hit and released the spool; after giving the bass some line, he set the hook. The bass made a wild lunge and left Bill's jig in a bush. After retrieving the lure we moved on. Bill was using a light spincast outfit and I had an open face spinner, with twelve pound test line. I prefer the open face spinner because it's easier to use heavier line. In this bottom scrapping, fish hanging unwanted objects is frequent and the heavy line helps save your hardware. Bill accused me of grubbing along with my bottom scrapping.

Several points later I landed another bass and when it came topside the plastic worm went one driection and the fish another. The tender worms were breaking off at the leadhead. The worms I was using were more flexible than most and also more tender. "Three bass and three worms", Bill said, "that's expensive fishing, a worm for every bass". I agreed with him while I put on a tough blue worm that was hard enough to take some chewing. After casting it awhile without any luck I changed to a floating, diving plug such as the Rebel and Rapala, and the lures are catching on fast around my home. Most all large gamefish will strike it. A swirl later I was fast to a jumping fish. It made a beeline for a bush but the rod pressure was too great, it came out, then, tried to bulldog its way back in. After several uncertain moments, Bill made a successful scoop with the net.

The three bass were caught on black worms and when I changed to blue the action stopped. I wondered if it was the color, the tough worm, or maybe both. Bill hung another bass and lost it. Bass are hard to hold using a jig-worm combination. If the fish succeeds in reaching a snag or getting enough slack line on the jump, the jig is almost money-back-guaranteed. After several minutes of fruitless casting with the floater I changed back to a black worm and jig.

There are several ways to fish a leadhead jig, one way is to cast out letting the lure lie motionless for 30 to 60 seconds then short jerks with 15 to 20 seconds between jerks. Another retrieve that produces at times is to cast the lure in the desired spot and let lie for 30 to 60 seconds then jerk, another pause, then a slow deliberate retrieve just fast enough to keep the lure from hanging up.

After easing close to a point I made a long cast. The lure hit within inches of the bush; after letting the worm lie motionless about 30 seconds, I gave it a short twitch. A pause, then I tightened the line and it started for deep water. I set the hook and hung on; this fish was heading for deep water before commencing the real battle. Lots of time a lunker bass will take his fight to deep water. With the drag protesting and the pressure I was giving the fish I knew it was no youngster. The fish wouldn't turn, so I held the rod high keeping a tight line and holding my breath. The bass made a jump, somersaulting, shaking its head bulldog-like. "Oh, oh!" another worm sailed into the air. The wild fish raced toward the boat then under it. I stood up shoving the rod tip into the water giving line at the same time. Finally I got it boatside and Bill slid the mesh under it. A beautiful 5¼ pounder.

It was ten o'clock and I had to work that afternoon, but with the fish still striking we would fish as long as possible. Bill suggested going to the Panhandle and trying several points. He had a special point in that direction that he boated a 4 and 6 pounder within several casts. I would be partial to that point myself.

I was skeptical when first confronted with the theory that certain points produced more strikes regularly, but it's true. When fishing a certain area with which I am familiar, there are usually several points that I can depend on if bass are feeding. One late spring day I drove to Kerr Reservoir alone, hoping to tie into some largemouth. I hung into and boated a fat, sassy bass on the first point that I worked. After fishing some points on the main channel I still lacked a bass or two of filling my limit. It was after sundown and several hours had elapsed since I caught the first bass. As the boat eased within casting distance I cut the motor. The lure hit several feet from shore. I cranked the handle once and a fish clobbered the leadhead, tearing out to deep water. This was the first point I had fished and also the last. It was 4½ pounds of muscle—the largest of the day.

• **continued on page 27**

The Scarlet Snake

by Franklin F. Snelson, Jr.
and William Palmer
Cornell University and N. C.
State Museum of Natural History

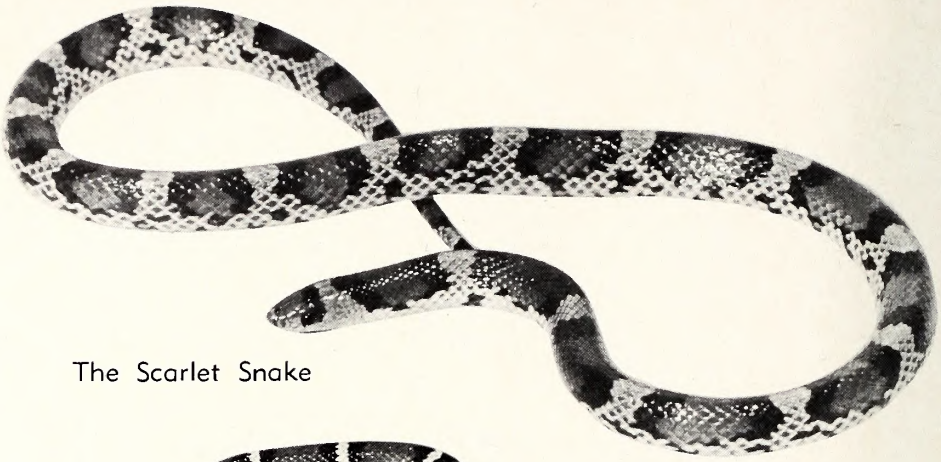
RATHER closely allied to the kingsnakes, the scarlet snake, *Cemophora coccinea,* is a secretive, gentle, and very colorful species. The pattern is composed of black-edged red blotches separated by yellow or grayish interspaces and is brightest in younger specimens. The snout is red and the underside of the body is unmarked. The nose is pointed and well adapted for burrowing in sandy and loamy soils. The scarlet snake and scarlet kingsnake are sometimes confused with the venomous coral snake. To further complicate matters, the three species may often be found in the same general habitat.

However, in both harmless forms *the snout is red, and the red and black areas of the body touch. The snout of the coral snake is black, and the red and yellow rings are in contact.* In addition, the underside of the scarlet snake is white and unmarked since the pattern is composed of blotches and not rings.

Scarlet snakes average about 15 inches in length, but a few specimens slightly exceeding 30 inches have been recorded. The largest personally examined from North Carolina measured almost two feet.

The geographic range of this species extends from the pine barrens of southern New Jersey, south throughout Florida and west to eastern Oklahoma, with apparently isolated populations in southeastern Texas and perhaps in central Missouri and the southern portions of Illinois, Indiana, and Kentucky. In North Carolina specimens have been taken from as far west as Clay County, but the species is most abundant in the Coastal Plain.

Scarlet snakes are certainly among our most secretive species and probably spend most of their time underground or sometimes beneath rotting stumps. logs, leaf litter, and similar ground cover.



The Scarlet Snake

The Scarlet Kingsnake

PHOTOS BY JOEL ARRINGTON

Apparently the preferred habitats in this State are those sandy areas of pine and scrub oak in the Sandhills and southeastern Coastal Plain where such a burrowing species would unquestionably find a suitable environment. Moreover, the fossorial habits of the scarlet snake are further exemplified by the fact that collectors have spent many daylight hours searching unsuccessfully inside and beneath rotting logs, stumps, and other cover in areas known to harbor this species; only to return after dark and find one or more specimens crossing paved roads through the same area where their daytime labors had met with failure. All of the examples that we have personally collected were taken at night on roads traversing the typical dry, sandy pine and oak woods. We personally know of less than a dozen scarlet snakes secured by any other means, and most of these were discovered during excavating operations.

The food of the scarlet snake consists of lizards, small snakes, the young of small mammals, and especially the contents of reptile eggs. Active prey is overcome by constriction.

Very little is known of the breeding habits of this species in the State. The literature records clutches of up to eight eggs probably laid in the summer and hatching in August or September.

For many years this species was considered a poor captive since almost all individuals refused to feed when placed in captivity. Nevertheless, because of their bright coloration and gentle nature, scarlet snakes were and continue to be sold in large numbers by southern reptile dealers to pet shops in the north. Undoubtedly most of these specimens eventually starved to death. Recently, however, we have learned of a few examples that supposedly fared rather well under captive conditions when provided with a place to hide and given as food the contents of chicken eggs placed in a shallow dish. These snakes were said to have avidly gorged themselves upon such nourishment. Perhaps such easily obtained food is the answer to the reptile fancier's problem of keeping these attractive snakes in captivity.

The Brook Trout

by J. H. Cornell
Chief, Div. of Inland Fisheries

THE brook trout is our only native mountain trout. Both the rainbow and the brown are introduced species. The rainbow came from western United States, from the streams that flow into the Pacific Ocean. The brown trout, under different names, was introduced both from Germany and from Scotland. The strains have become so intermixed that it simply is known as the brown trout—a most important addition to our modern game-fish list. But the aristocratic native brook trout, like a white-haired dowager with lorgnette in hand, has retired to the solitude of the mountain tops to look disdainfully down-stream at the Johnny-come-late-lys.

The ichthyologists inform us that the brook trout is not a trout at all, but a "charr". The principal difference between the charrs and the trouts is in the shape of the vomer—a tooth-bearing bone in the roof of the mouth. This approaches the point of being a distinction without a difference. They belong to the same family, and they are so very closely related in form and characteristics that we may as well consider them all "trout" and get on with our fishing.

Contrary to the opinion of many fishermen who never have observed it closely, the brook trout does have scales. They are so deeply embedded in the skin and are so fine that they may be entirely unnoticed, and eaten without thought of removal. With a magnifying glass it is possible to count about two hundred thirty of them in the lateral line. Like the other members of the family, there are no spines in any of the fins. There usually are ten soft rays in the dorsal fin and nine in the anal.

Habitat

The home of the brook trout is in our most picturesque waters. The fast-flowing mountain streams that leap from ledge to pool, the shaded spring brooks which stay cold on the warmest summer day, the very headwater branches which are too small and too cold for rainbows, these are the home of the brook trout.

There was a time when the larger mountain streams, as well, had native brook trout populations. Then there were no bare mountain sides to let the sun warm the streams. There were no hillside corn fields and logging roads and skid trails to put silt in the streams after every shower. No raw-banked highway fills and cuts. But we have them now. They are the price of our so-called "Civilization", with its obvious disregard for the conservation of our natural resources.

The hand of man has driven back the brook trout until the only natural habitat left which is suitable for a fish of clean cold water is the smallest streams at the highest elevations. They do not grow large in such small streams, but we still have native wild fish for the angler who will seek them out.

The white-edged fins and mottled back make this brook trout easy to identify. Body colors vary somewhat from fish to fish.

Brook trout prefer streams with a mean temperature of about fifty degrees, and thrive best where the maximum mid-summer temperature does not exceed sixty-six degrees. Even with an adequate oxygen supply, sustained temperatures above seventy degrees are soon fatal.

It is likely that newly constructed mountain reservoirs may extend the range of the brook trout. Even though the streams become too warm, suitable temperatures may be found in summer in the deeper waters. Unless the oxygen supply is deficient at depths where the preferred temperature is found, good brook trout fishing can be developed. They seem to succeed much better than rainbows or browns when restricted to lakes, for these latter species require suitable tributary streams for reproduction.

Life History

In late summer, beginning in late August or September, brook trout begin to migrate upstream. After a few weeks, as the water becomes colder, they move into the gravel-bottomed areas of the spring branches to build their nests. Those in lakes will move up the tributary streams to find suitable spawning grounds.

The female prepares the nest without help from

• **continued on page 16**

The Brook Trout Story follows in color on the next two pages. The paintings show the highlights of the brook trout's life. Illustrations by Duane Raver.

Brook Trout Story

For several weeks during the fall spawning season, the male brook trout (upper) develops a hooked jaw and takes on brilliant reds and blues on his sides. Clean gravel is selected for the nesting site and a shallow depression is scraped out by the female trout.

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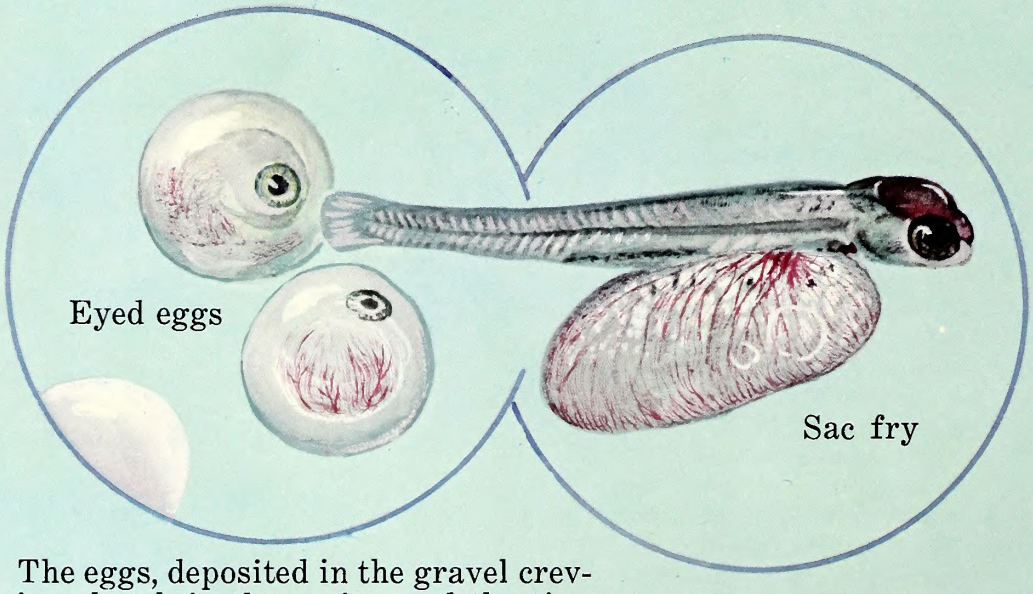
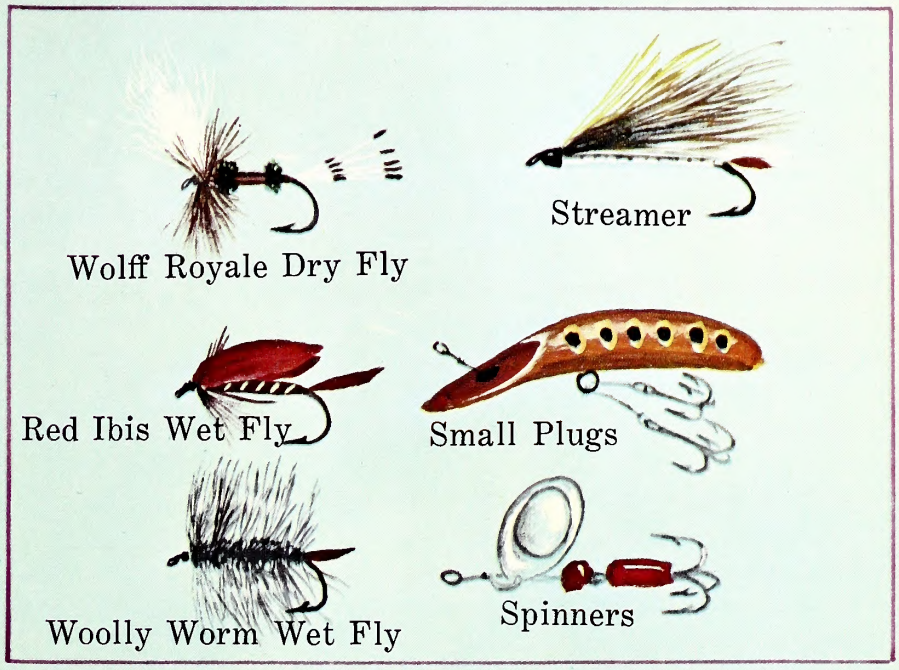


The eggs, deposited in the gravel crevices, hatch in the spring and the tiny fry exist on the yolk sac for a week or more before beginning to feed on tiny organisms.

Fingerling brook trout retain the blotches along their sides until they reach about six inches in length. These are called parr marks. This trout was four inches long.

out eats a wide range of foods
ects from the land and water,
small fish. Shown, clockwise,
the grasshopper is a damsel-
an adult mayfly, a mayfly
lbellied dace, and two caddis-
r cases. Center, a stonefly



Most fishermen agree that the brook is the easiest of the three trout to catch. Here are but six of the long list of favorite artificial lures which will take the brookie. The rest is up to you.

Although the brightness and brilliance of individual brook trout vary, the general color patterns are similar in adult fish. The back, tail and dorsal fin markings are wavy lines or "wormlike" lines rather than spots. A native brook that weighs a pound is a good catch, and a two-pounder is exceptional. The key to more brook trout is cold, clear water.

• continued from page 13

the male. She turns on her side, and moving her head and tail rapidly up and down, dislodges the gravel and pushes it aside. When it is completed, the nest will be a foot or two in diameter and several inches deep. While the nest-building is going on, the male is busy fighting with intruders and driving them away.

When the nest is ready, they move into it side by side. The eggs are extruded and fertilized. The female immediately goes to work in covering up the eggs with gravel, and the male returns to the job of driving away all fish looking for a dinner of trout eggs. Gravel is piled on the nest until the pit is filled to the level of the stream bed or higher. As soon as the eggs are covered, there seem to be no further efforts at predation.

One would think that the current would carry the eggs out of the nest and down the stream. This does not occur because the eggs, when they are first extruded, have a very sticky coating which attaches them to the gravel of the nest. After they become water hardened and lose their adhesive quality, the gravel covering keeps them in the nest. Several weeks later, as the water begins to warm, the fry hatch out and work their way up through the gravel into the stream.

In those lakes without available tributaries, brook trout may have considerable success in spawning in the lake itself. In this respect they are different from browns and rainbows. On gravelly shores, especially where spring water seeps up through the gravel, they can spawn successfully.

Importance

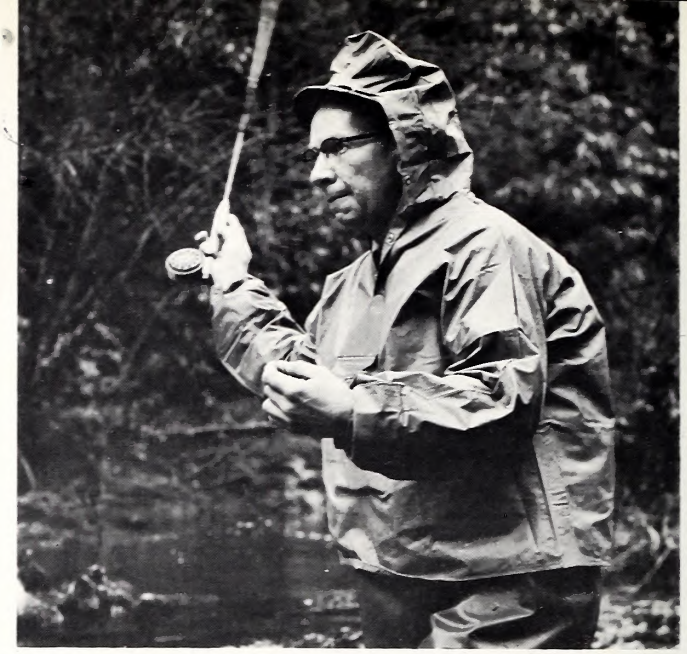
The high esteem in which the brook trout is held by fishermen probably is a reflection of its willingness to commit suicide on the end of a fishing line. It has a reputation for being shy and wary. It is. The fisherman must approach the stream, especially if it is low and clear, with utmost caution. There must be no hurried approach, no waving of arms or rod on the stream bank, or shadow on the water.

All trout are extremely shy and may hide for a half-hour or more if they are frightened. This is why a lot of fishermen on a stream will reduce the total catch almost to zero, even though the stream is heavily stocked. A cautious approach is essential to trout fishing success.

But after reaching the water without frightening the fish, the brown or rainbow may insist on a fly that closely imitates its natural food. Not so the brook trout. Gaudy flies, like the Mickey Finn and the Royal Coachman, are acceptable and so is a pectoral fin of the brook trout itself. In fact, the Parmachene Belle was originally tied to imitate the fin of a brook trout.

In the early season, with characteristic high water conditions, worms seem to be the preferred bait. At least, they are easy for the fisherman to find, and the trout don't seem to care. They eat them, even though worms occur as a regular item of their menu only about once in every hundred animals they eat.

Fishermen understand that a worm belongs near the stream bottom. Under high water conditions, most trout are hiding at the bottom of deep pools and a split shot or two will take the worm down to them. Wonder why, under the same conditions, so few fishermen try a nymph or wet fly, with the same split shot to get it where the fish are?



JOEL ARRINGTON

This angler is ready for showery weather as he tries for the brook trout. He's using a short, lightweight fly rod.

After the spring flood waters run out of the streams and the water temperature gets up in the vicinity of sixty degrees, the insect life begins to move in the riffle areas. Then the trout move out of the deep holes and into the dining room. Then the fly fisherman comes into his own, and no split shot are needed.

Now let's see what temperatures mean to a brook trout. When the stream temperature is under fifty degrees, they will be in deep holes, in slow currents, and under the cut banks. Most fishermen find natural baits most effective—worms, hellgrammites, or small minnows.

In the fifty to fifty-five degree range, wet flies are effective but they must be fished deep. This is the time for nymphs to produce results, as well as streamers of suitable size. There will be little use trying to get results on dry flies in this temperature range.

From fifty-five to sixty degrees, some few fish may be taken on dry flies, but wet flies will produce more consistent results. It is at about sixty degrees when the hatches of natural insects begin to emerge, and above that temperature the dry flies come into their own.

When the stream temperature is above sixty-eight, brook trout begin to feel unhappy. They hunt for spring holes or the mouths of spring branches where the water is a little cooler. Most of their feeding is at night or very early in the morning, and again under these conditions, live bait is more effective than anything else.

It really isn't much of a trick to catch brook trout. All you need is a minimum of equipment, a thermometer, and a stealthy approach. And just like Barkus, the brook trout are willing! ⬍

NORTH CAROLINA WILDLIFE

North Carolina State Library
Raleigh

RESOURCE-O-GRAM

A ROUNDUP OF THE LATEST WILDLIFE NEWS

Hunting Regulations Set June 6

June 6 has been set as the date for the Wildlife Resources Commission to establish the 1966-1967 hunting regulations for non-migratory game species. Except for calendar adjustments, little change is expected over the 1965-1966 hunting regulations.

Regulations for taking such migratory game species as doves, marsh hens and waterfowl are established by the federal government, and will be announced later this summer. The U. S. Bureau of Sport Fisheries and Wildlife usually gives states a framework of dates and bag limits from which to select seasons and bag limits.

Keep Household Pets Confined

The Wildlife Resources Commission urges owners of dogs and cats to keep their pets confined during the breeding season for upland game. June is usually the peak of the breeding season for both big and small game. Stray or wandering dogs and cats are believed to be capable of destroying more game than hunters bag during the open season. Pregnant deer are especially vulnerable to free-running dogs.

Safe Boating is Common Sense

The month of June is one in which boating on the waters of N. C. is a major outdoor activity. Almost 100,000 boats will be plying waters of the state, and the Wildlife Resources Commission urges all boaters to exercise courtesy and extreme caution. All boats powered by machinery of more than ten horsepower must be registered and properly numbered, and all power boats should have an approved lifesaving device readily available to each person aboard.

Fishing Is In Full Swing

Fishing in both fresh and salt water usually reaches a peak in June, and the Wildlife Resources Commission anticipates that a record number of anglers will be on the waters of the state throughout the summer. Be sure you have a valid fishing license in your possession while fishing!

Quail in June

Quail in June? Actually these birds were downed during the regular season last fall but the planning and planting took place long before that. We hope you've started yours.

by Jim Dean
Burlington Daily Times-News
PHOTOS BY THE AUTHOR

WHEN you're walking into a man's yard, you don't expect to flush a covey of quail—but this was an unusual day.

One minute, we were walking up the path past the barn, talking and joking, and the next minute the air was full of quail.

Dick Eggleston and I turned to follow the largest bunch as it disappeared around the barn, and just as Dick dropped a bird, I saw our other companion, W. S. Gardner, lower his gun with a surprised look on his face.

"That crazy bird flew right into the loft," shouted W. S. excitedly. "I wouldn't have believed it if I hadn't seen it happen. I was just getting ready to let him have it when he ducked into the opening."

While we retrieved Dick's bird and marveled about the sudden rise and the feathered fugitive who had made his escape through the loft, our host, C. V. Ferguson, walked up to the nearby house to tell the folks that it was only their neighbor and some friends hunting, not an invasion.

"You know, that makes more than 65 birds we've seen this afternoon, counting the first three coveys," said Dick.

It was a remarkable fact, and we agreed that the estimate was conservative. What we didn't know was that we still had another covey, the fifth of the day, ahead of us. It would bring the number of sighted quail to more than 75 birds—all in one short afternoon.

"They're big, fat birds too," said W. S., who is a Burlington druggist. "And these last two coveys must have had at least 20 birds in them."

W. S. shook his head in amazement. "I've seen more quail in two hours today than I've seen all year."

As we stood talking, we began to view with new respect our hospitable host, C. V. Ferguson, and his quarter-century vigil to create the excellent hunting we were now enjoying.

The fine crop of healthy quail and other small game that live on his farm and other farms in the community is largely due to his efforts in promoting food and cover plantings, and many long, hard days of work in the fields.

His own farm is a masterpiece in game production, and his work has influenced many farmers and young boys in the Eli Whitney Community in southern Alamance County where he lives.

"This is what I wanted you fellows to see," said Dick, who is district game biologist for District Five, which includes Alamance County. "It's the best proof I know that good game management with an adequate food and cover planting program can pay off. Mr. Ferguson has taken a special interest in our wildlife program, and has even offered a prize in the local community wildlife and conservation contest among the local farmers and boys."

Ferguson is a rare man in many respects. He seldom hunts himself, and keeps strict control over the few who are allowed the privilege of harvesting the game on his self-made wildlife paradise.

"He's used almost every available bit of information and seed supply that the Division of Game has to offer," said Dick. "That second covey, for instance, was found in the middle of a soy bean field that had rows left standing around the edges for birds."

"They probably wouldn't have been there if the beans hadn't been left," said W. S.

Later, we found yet another covey after Mr. Ferguson rejoined us, and like the others, it had been near food and cover that

C. V. Ferguson, Eli Whitney farmer, and Wildlife Biologist Dick Eggleston talk "birds." (below) "That's where he went," says Eggleston, pointing to barn.

had been planted. Along with the five coveys, we had also sighted three rabbits, and Dick identified a woodcock—a bird that is not frequently seen in this area.

The progress on Mr. Ferguson's farm and the others in the community has not come about overnight.

"It's been a gradual thing," said Ferguson. "You can't plant food and expect the birds to come right away, or even perhaps within a couple of years, but we certainly see more birds now than we did even a few years ago. It's not unusual to have a covey feeding in the patch in the backyard."

A slender man, who doesn't look his sixty some years, Mr. Ferguson is slow to take credit for his achievements. He prefers to remain in the background. In some ways, he reminded us of the kind of man that might have pioneered this country and learned to love game beyond its ability to stock the family larder.

Everywhere we walked over his 60 acre farm and the adjoining farms, we could see his influence; an extra row of soy beans left in the edge of a field, a stand of lespedeza, hedges of multiflora rose and all forms of food and cover.

Mr. Ferguson's interest and influence on the bird population in the community goes back nearly 25 years, and although others have helped considerably, especially in recent years, his own work has been largely responsible for the rise in the local bird population.

For years, he has encouraged the local farmers and youths in the area to take advantage of the state's offer to provide seed and expert advice for creating food and cover crops.

Each November, the Conservation Committee of the local Ruritan Club gives awards in conservation, forestry and wildlife.

Mr. Ferguson, in the past, offered a personal prize to sixth and seventh grade boys in the areas, with the prize going to the boy who contributed the most toward helping wildlife in the area. The prizes, which are now presented by the committee, were not large, but they were avidly sought by the local youths, and were a matter of considerable pride.

A visitor to Mr. Ferguson's farm, and indeed, many of the other farms in the community, will find abundant annual patches including buckwheat, milo, browntop millet, soy beans, lespedeza and cow peas. Many of the farmers also have experimental plantings of re-seeding soy beans, bicolor lespedeza, desdemodium (tick clover), partridge peas and Korean lespedeza.

Long hedgerows of multiflora rose line many fields in the area, providing quail and rabbits with cover and food.

Mr. Ferguson has spent most of his life in the services of conservation, both in his own community of Eli Whitney, and with the U. S. Soil Conservation Service.

As early as 1923, he released quail on the farm, but he says that his experience indicates that this practice is often unsuccessful.

After 1940, he began to take an active part in the Wildlife Commission's food and cover program.

For two years, he has been a supervisor of the soil conservation district in Alamance County, and has also been principal of county schools in Alamance, Guilford and Rockingham counties.

In 1945, he became soil conservation aide for what was then the Neuse River Conservation District, which encompassed 11 counties, and retired in 1960 to do a little farming "for the fun of it."

His interest in wild game is also a "fun" project.

"I've always liked quail and other game," said Ferguson. "I don't do it just for the hunters. In fact, we let very few hunters hunt on our farms. The main reason we have birds here now is because we have provided cover and food, and also kept all hunting under strict control. Hunting is better here now than it has ever been."

His whole farm is a model of good conservation practices. In addition to providing food and cover for small game, he also has three ponds. Two of them have just been stocked with channel catfish—a favorite species among the local anglers. Bass and bream also abound in the ponds.

Mr. Ferguson's conservation efforts have not been without results. The community, and in fact, the whole southern quarter of Alamance County has more birds than would have been possible without his work, and he has created enough interest to make certain that this area will have superior bird hunting and abundant wild game for many years to come.

"He's an asset to the community in every way, but especially in the field of conservation and wildlife preservation," said one of his neighbors. "We are proud of what he has done."

These sentiments apply to men like Mr. Ferguson all over the state. Sound conservation practices and excellent hunting go hand in hand.

• **continued on page 26**

Creel Census - 6

*Sunfishes, Crappies and White Perch

by Dr. F. F. Fish
Asst. Chief, Div. of Inland Fisheries

THE previous chapter in the story told by the Statewide Creel Census concerned the relative contribution to the overall sports harvest from the inland waters of North Carolina made by the individual groups of fishes. Now it is proposed to examine each one of the major groups at least to determine where these fish are taken, with what baits and gear, and in what relative numbers.

Starting with the sunfishes, which numerically proved by far the dominant group of fishes harvested by rod-and-reel, in the summary of Table 6-A the statewide catch data for the sunfishes have been divided into the proportions taken in each district of the State. It appears from the data of this table that the sunfishes are anything but the exclusive property of any single area, for they are universally taken throughout the State although not in equal numbers. The waters of District 1 yield more sunfishes than do those of any other District. In every District, however, the sunfishes constitute a very important component of the total sports-fish catch and invariably a component that far exceeds that of the largemouth bass as the data of Table 6-B show. Even in District 9 where the sunfishes' contribution to the statewide catch is the least, it still exceeds the catch of either the largemouth bass or the mountain trout.

As to the type of fishery supported by the sunfishes, the data of Table 6-C show it very definitely to be a "cane-pole-natural-bait" affair for essentially three-fifths of the sunfishes are taken with this combination of gear and bait. This fact does not imply, however, that sunfishes are primarily taken by unlicensed anglers. The sunfish catch is almost exactly proportional to the number of anglers—the licensed anglers constitute 48 percent of the fishing public and they catch 51 percent of all sunfishes taken from the inland waters. As might be expected considering the generally small size of these fishes, the anglers using strictly artificial lures for sunfishes generally present them with a fly rod. This gear-bait combination, however sporting it may be, accounts for only slightly less than three percent of the total sunfish harvest.

The sunfishes are so universally taken throughout North Carolina's inland waters that it is difficult to single out any particular ones as the most likely sources.

Probably for the angler intent upon catching sunfishes, the more promising waters would be:

District 1: Bennetts Pond, Cashie River, Chowan River, Perquimans River, Rocky Hock Creek.

District 2: Black River, Broad Creek, lower Neuse River, Trent River, White Oak River.

District 3: Black Creek, Contentnea Creek, Gaston Reservoir, Lake Wheeler.

District 4: Cape Fear River, Hodgins Pond, Lumber River, Shoeheel Creek, Soles Swamp,

District 5: Cape Fear River, Chub Lake, Creedmore Lake, Deep River, Eno River, Flat River, Haw River, Stoney Creek.

District 6: Abbotts Creek, Blewett Falls Reservoir, Catawba Reservoir, Deep River, Flat Swamp, High Rock Reservoir, Lake Norman, Pee Dee River, Richardson Creek, Tillery Reservoir.

District 7: Bass Lake, Catawba River, Kerr Scott Reservoir, Lake Hickory, Lake Norman, Salem Lake.

District 8: Broad River, Lake Hickory, Lake James, Lake Lure, Lake Rhodhiss.

District 9: Lake Adger, Skyland Lake.

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*As used herein, the term "sunfishes" includes the bluegill, redbreast sunfish, rock bass, warmouth, yellow perch, flier, stumpknocker, and the other minor sunfishes.

TABLE 6-A
THE PERCENTAGE OF THE TOTAL STATEWIDE SUNFISH ROD-AND-REEL CATCH TAKEN IN THE INDIVIDUAL DISTRICTS

District	Percentage of Statewide Catch
1	26.3
2	15.0
3	10.8
4	8.7
5	6.5
6	14.1
7	7.3
8	7.9
9	3.4

TABLE 6-B
THE PERCENTAGE OF THE TOTAL DISTRICT CATCH BY ROD-AND-REEL CONTRIBUTED BY THE SUNFISHES, LARGEMOUTH BASS, AND TROUT

District	Sunfishes	Largemouth Bass	Trout
1	40.7	4.4	
2	74.5	3.6	
3	80.1	3.5	
4	67.1	3.0	
5	48.8	2.3	
6	35.5	1.8	
7	33.7	2.7	12.8
8	32.9	7.0	8.5
9	30.7	2.0	26.4
STATE-WIDE	44.0	3.6	3.5

TABLE 6-C
THE PERCENTAGE OF THE STATEWIDE SUNFISH CATCH BY ROD-AND-REEL TAKEN WITH VARIOUS COMBINATIONS OF GEAR AND BAITS

Bait ⟶ Gear	Natural Baits	Artificial Lures	Both	Total For Gear
CANE POLE	59.4	0.3	0.8	60.6
FLY ROD	4.9	2.8	1.5	9.2
CASTING ROD	12.0	1.8	3.1	16.9
2 LINES	6.4	0.3	6.2	12.9
3 LINES	0.1	0.0	0.3	0.4
TOTAL FOR BAITS	82.8	5.3	11.9	

THE crappie is the most popular single fish found in North Carolina waters. There are two species of crappie, the black and the white. Normally, one needs not travel far before hearing the proposition that the black crappie is superior to the white as a game fish—but most anglers of North Carolina will settle for either as a "take-home" prize. The larger quiet rivers, the big lakes and the estuaries of the Coastal Plain are the natural habitat of the native black crappie. The white crappie, a relatively recent immigrant from the Mississippi River drainage, seems to prefer the big power reservoirs, particularly those of the Piedmont, where it does extremely well where adequate food is available. The preferred habitats of the two crappie are quite evident in the comparative catch data by Districts summarized in Table 7-A which indicate the waters of District 1 and those of the Piedmont Districts as the chief producers of crappie. Unquestionably, the crappie attains its greatest stature as a full fledged and popular game fish in the Piedmont Districts as the data of Table 7-B clearly show.

The data on crappie catches by gear and baits, summarized in Table 7-C, show that although four-fifths of the crappie are caught with natural baits, still it is less of a "cane-pole" fish than are the sunfishes. The percentage of crappie taken on artificial lures is twice that of the sunfishes so taken and most of the artificial-lure crappie anglers, as well as the "natural baiters" prefer the casting rod over either the fly rod or the cane pole. The crappie also is much more the fish of the licensed angler than are the sunfishes for almost three-fourths (74.3%) of the crappie are taken by licensed anglers.

The better crappie waters of North Carolina are:

District 1: Areneuse Creek, Broad Creek, Cashie River, Chowan River, Conaby Creek, North River, lower Roanoke River, Rocky Hock Creek, Suttons Creek, Sawyers Creek.

District 2: Bear Creek Lakes, White Oak River.

District 3: Gaston Reservoir, Roanoke Rapids Reservoir, Lake Wheeler, Lake Wilson.

District 4: Lower Cape Fear River, Lumber River.

District 5: Chub Lake, Cone Lake, Creedmore Lake, Eno River, Flat River, Grassy Creek, Haw River, Lake Michie, Rocky River, Stoney Creek.

District 6: Badin Reservoir, Blewett Falls Reservoir, Catawba Reservoir, High Rock Reservoir, Lake Norman, Pee Dee River, Tillery Reservoir, Tuckertown Reservoir.

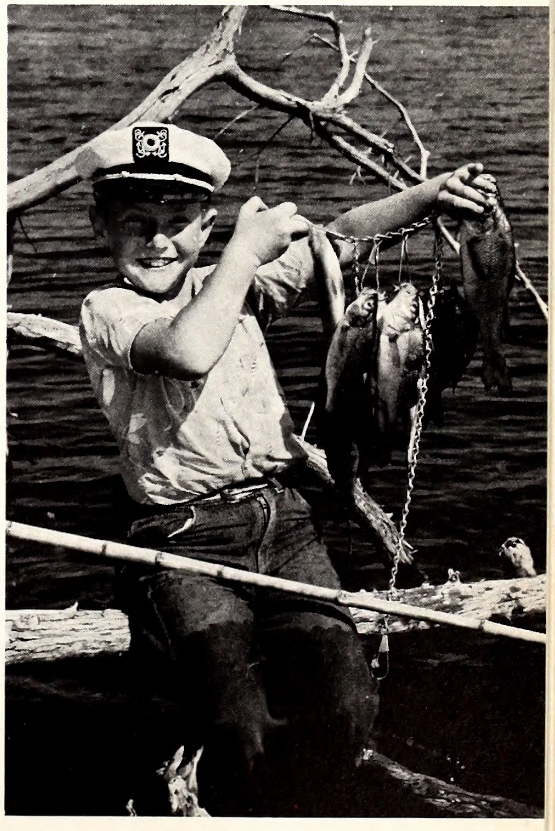
District 7: Lake Hickory, Lake Lookout, Lake Norman, Salem Lake.

District 8: Catawba Reservoir, Lake Hickory, Lake James, Lake Norman, Lake Rhodhiss.

District 9: Chatuge Reservoir.

THE third most popular fish with the inland-water anglers of North Carolina—at least as judged by the number taken home—is the white perch.

This native of the coastal waters, in addition to its pop-



A good catch of mostly white perch from the waters around Manns Harbor. Natural baits account for most of these fish.

TABLE 7-A
THE PERCENTAGE OF THE TOTAL STATEWIDE CRAPPIE ROD-AND-REEL CATCH TAKEN IN THE INDIVIDUAL DISTRICTS

District	Percentage of Statewide Catch
1	9.5
2	1.0
3	4.0
4	1.7
5	9.6
6	38.4
7	12.5
8	20.1
9	3.2

TABLE 7-B
THE PERCENTAGE OF THE TOTAL DISTRICT CATCH BY ROD-AND-REEL CONTRIBUTED BY THE CRAPPIE, LARGEMOUTH BASS, AND TROUT

District	Crappie	Largemouth Bass	Trout
1	6.2	4.4	
2	2.2	3.6	
3	6.7	3.5	
4	4.4	3.0	
5	30.4	2.3	
6	40.7	1.8	
7	24.3	2.7	12.8
8	35.4	7.0	8.5
9	12.1	2.0	26.4
STATE-WIDE	19.1	3.6	3.5

TABLE 7-C
THE PERCENTAGE OF THE STATEWIDE CRAPPIE CATCH BY ROD-AND-REEL TAKEN WITH VARIOUS COMBINATIONS OF GEAR AND BAITS

Bait → Gear	Natural Baits	Artificial Lures	Both	Total For Gear
CANE POLE	36.6	0.9	0.6	38.1
FLY ROD	2.3	1.6	1.6	5.5
CASTING ROD	23.3	7.5	8.0	38.8
2 LINES	9.8	0.6	7.1	17.5
3 LINES	0.1	0.0	0.1	0.2
TOTAL FOR BAITS	82.8	5.3	11.9	

TABLE 8-A
THE PERCENTAGE OF THE TOTAL STATEWIDE WHITE PERCH ROD-AND-REEL CATCH TAKEN IN THE INDIVIDUAL DISTRICTS

District	Percentage of Statewide Catch
1	84.5
2	1.2
3	0.1
4	3.8
5	0.3
6	8.0
7	2.0
8	0.1
9	0.1

TABLE 8-B
THE PERCENTAGE OF THE TOTAL DISTRICT CATCH BY ROD-AND-REEL CONTRIBUTED BY THE WHITE PERCH, LARGEMOUTH BASS, AND TROUT

District	White Perch	Largemouth Bass	Trout
1	36.3	4.4	
2	1.6	3.6	
3	0.3	3.5	
4	8.2	3.0	
5	0.6	2.3	
6	5.6	1.8	
7	2.5	2.7	12.8
8	0.1	7.0	8.5
9	0.1	2.0	26.4
STATE-WIDE	12.6	3.6	3.5

TABLE 8-C
THE PERCENTAGE OF THE STATEWIDE WHITE PERCH CATCH BY ROD-AND-REEL TAKEN WITH VARIOUS COMBINATIONS OF GEAR AND BAITS

Bait → Gear	Natural Baits	Artificial Lures	Both	Total For Gear
CANE POLE	34.6	0.1	1.2	35.7
FLY ROD	0.1	0.1	0.1	0.2
CASTING ROD	35.5	2.2	16.6	54.3
2 LINES	2.7	0.1	7.1	9.8
3 LINES			0.1	0.1
TOTAL FOR BAITS	72.8	2.3	24.9	

ularity as a sports fish, also supports a lively commercial fishery amounting to about a quarter of a million pounds each year that is centered largely in Albemarle Sound and its contiguous brackish-to-fresh waters. The white perch is an excellent game fish under conditions of ample food and sufficient predation or exploitation to preclude their inclination towards over-population. The white perch bites readily upon either natural or small artificial baits and they may be caught, at times, almost as fast as a hook can be dropped overboard. Because of their great popularity along the coast, they were relocated inland many years ago. In almost all cases, the inland habitat for one reason or another was less to their liking than their native coastal waters and this extremely prolific fish very rapidly developed stunted populations of great numbers. As a consequence, the white perch never became a very popular fish except in coastal waters.

The data summarized in Table 8-A leave very little doubt that the waters of District 1 support the bulk of the sports fishery for white perch. In fact, aside from these waters, Lake Waccamaw, and the Yadkin River reservoirs, the white perch is a sports fish of very minor significance. In these few waters, the white perch makes its reputation as the third most popular fish found in the Statewide Creel Census.

Although the white perch strikes small artificial lures readily, only an insignificant fraction of the sport catch is taken with this type of bait. As shown in Table 8-C, the white perch sports fishery is predominantly a natural-bait proposition with the gear choice almost equally divided between the cane pole and the casting rod. The fly-rod fishery for white perch is almost nonexistent. Even so, the white perch is even less the fish of the unlicensed angler than is the crappie. Only 17.5 percent of the white perch caught by rod-and-reel are taken by unlicensed anglers.

The most productive inland waters for white perch fishing are Lake Mattamuskeet, Albemarle Sound, and the waters tributary to Albemarle Sound. The latter include the Cashie River, Chowan River, Currituck Sound, Kitty Hawk Bay, Pasquotank River, Perquimans River, Yeopim River and the lower Roanoke River. Next in line are Lake Waccamaw of District 4 and the Yadkin River Reservoirs—High Rock and Tuckertown in particular—of District 6. Excepting these waters, the best white perch fishing will be found in the lower Tar River of District 2, Creedmore Lake of District 5, and Salem Lake of District 7.

Conducted by John Parker

Performance Tip:
Installing an Outboard

How you mount your outboard motor is vital to performance, reports the Evinrude Motors service department. This applies to small outboards as well as the larger units.

There is no simple "rule of thumb" for the correct engine height or vertical angle. Each boat is different and every installation must be handled differently. The Evinrude service experts also point out that although height and angle are two separate things, they must be considered together.

As a starting point, the engine should be mounted so that the cavitation plate is parallel to and slightly below the bottom of the boat. The angle adjustment rod should be set in the second notch. Remember, these are just starting points, and both engine height and lower unit angle can and should be changed if circumstances call for it.

A shakedown cruise is a must, and it should be carried out under normal load situations. Two extra passengers, a soft drink cooler, extra fuel cans and the general assortment of boating gear will have a tremendous effect on how your boat handles and performs.

Once underway there are four things to watch for: (1) cavitation; (2) excessive spray; (3) porpoising; and (4) plowing. If any of these symptoms occur, you can be pretty sure the motor is not mounted properly.

Cavitation and excessive spray can usually be traced to the height of the motor. Cavitation occurs when the engine is mounted too high on the transom and air is introduced into the path of the propeller. Air has less resistance, and the propeller is free to turn at a much faster rate.

Excessive spray, caused by the spray plate on the lower unit. means the engine is mounted too low on the transom.

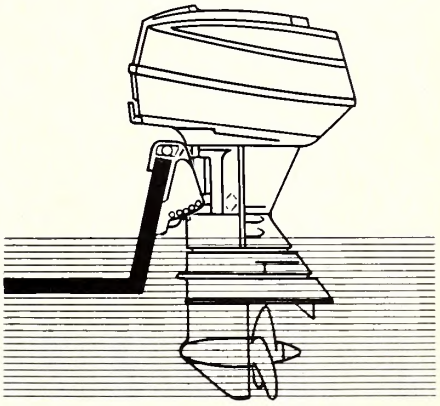
Porpoising (the bow seems to bounce on the water) and plowing (the bow seems to smack into the water) can often be traced to the angle of the lower unit. One word of caution: The weight of passengers and extra gear could be the culprit. To correct porpoising move weight forward. If the bow is plowing, move weight aft.

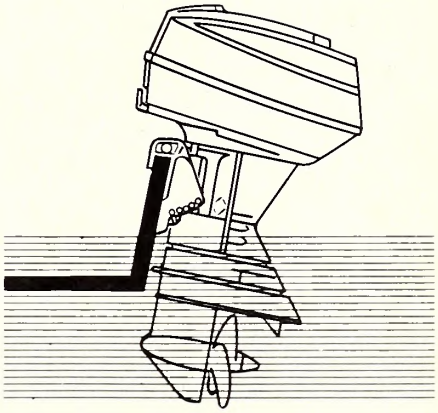
If re-arranging equipment doesn't solve the problem, you may have a minor defect in the hull. Changing the angle of the lower unit will compensate for this defect, although you may sacrifice some performance efficiency. Porpoising can be cured by moving the lower unit closer to the transom. Plowing can be cured by moving the lower unit away from the transom.

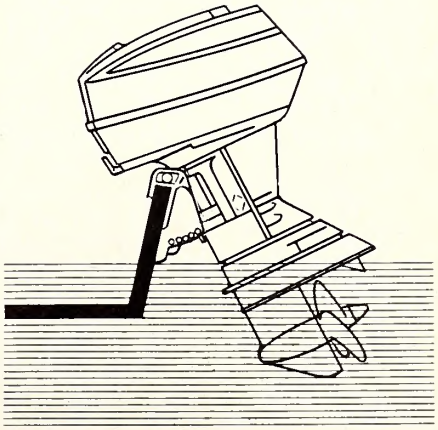
Throughout the installation, remember that your goal is efficient propeller thrust. This occurs when the path of the propeller is parallel to the water level when the craft is underway.

Measure Performance

A tachometer, which measures the revolutions per minute of your outboard motor, is one sure way to check performance. If your engine is turning faster (more rpms) than it should, a propeller change could solve the problem. Select a new prop with more pitch to the blades.







(Top) Outboard is correctly installed with propeller thrust straight forward for maximum efficiency. (Center and bottom) Lower unit too close or too far away from transom. The result will be erratic performance and poor handling.

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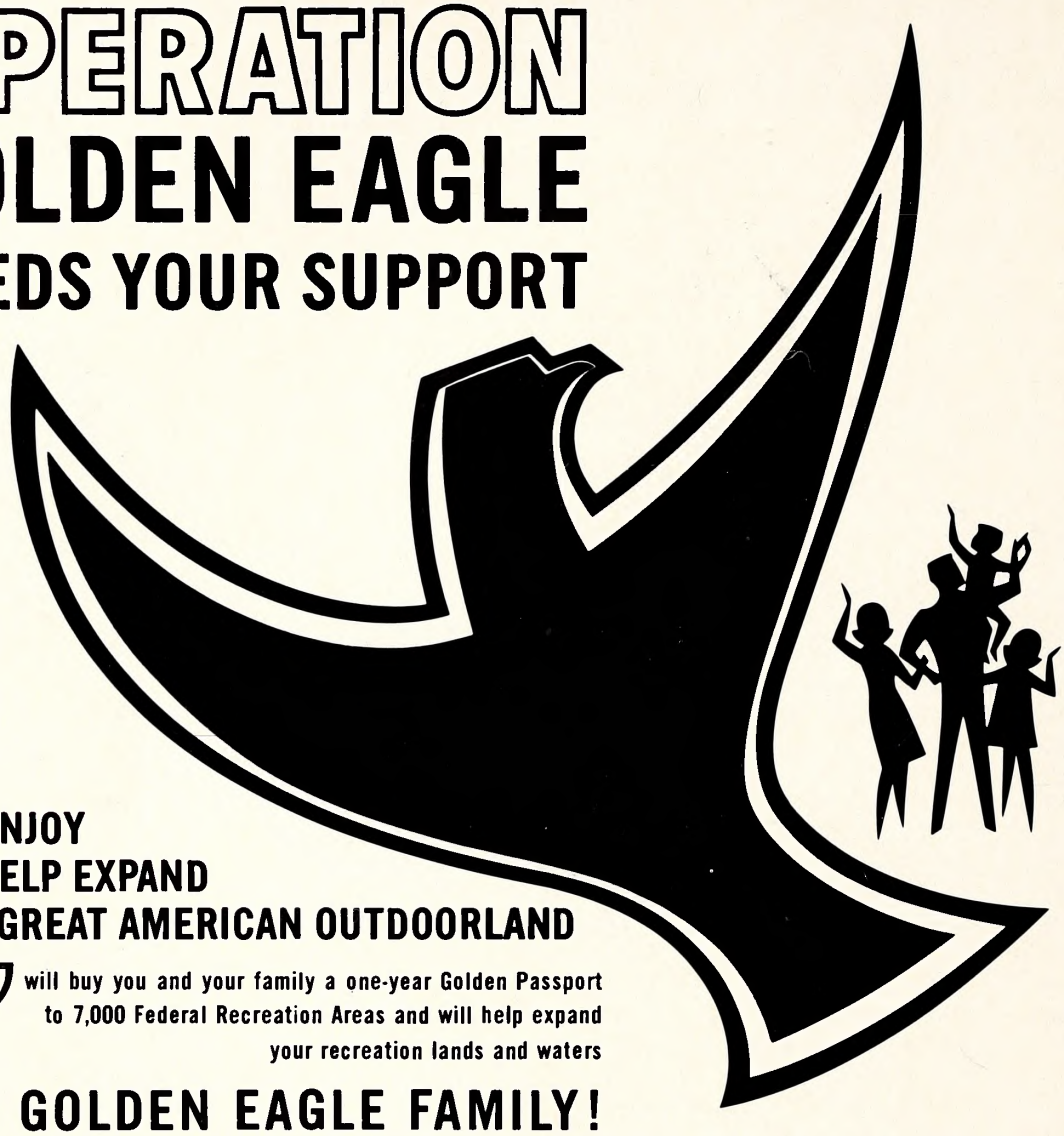

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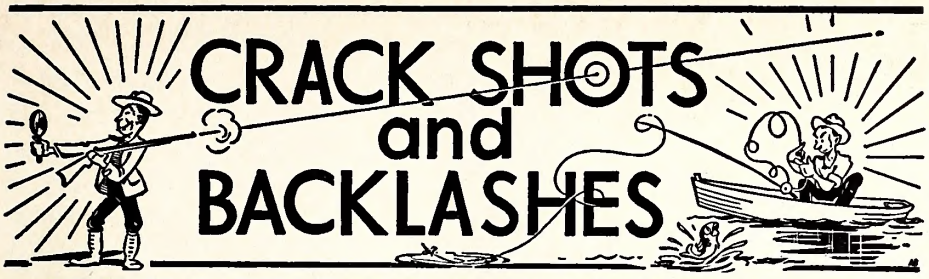

DEPARTMENT OF LETTERS TO THE EDITORS, FIELD NOTES, AND ITEMS OF INTEREST

Conducted By Rod Amundson

Murder of a Trout Stream

On April 2nd, hundreds of trout fishermen converged on the trout streams in the Blue Ridge Mountains. Some found their favorite brooks just like they dreamed of them through the long cold winter months, but a great many discovered their pet streams nothing but a straight stream of fast running water about four or six inches deep and all the meanders that make for a good trout stream gone. No pools, no shelving banks, no cover, murdered for trout fishing for years to come. Naturally he wondered why anyone would want to completely annihilate such a beautiful trout stream, and how it could benefit anyone, counting the hundreds of dollars it has cost to do this thing.

What he should know, but of course he doesn't, is that his own tax money may have been used in the murder of his favorite trout stream.

A few years past, at the Upper Mountain Experimental Station at Laurel Springs, an experiment was conducted on Big Peak Creek, which in my opinion was the best native brook trout stream in Ashe County. About one mile of this stream was straightened as a pattern for farmers to follow. All the brush cover was removed, all the meanders were taken out, all the pools were destroyed, and all the fish were dozed out with bulldozers and other heavy machinery. Consequently, murder was done to this great trout stream. At what price glory, possible $25.00 in feed was added per year for all the hundreds of dollars spent; but a mile of good trout water was destroyed.

How much is a good trout stream worth? One thousand, five thousand, or can anyone set a price? A trout stream is a valuable asset for anyone to have and we should be having demonstrations on how to make them better, rather than how to murder them.

The trout fishermen in North Carolina number upwards of 100,000 and we pay our own way. Let's raise some sand and try to stop these trout stream murders. Take a good look and see the many miles of what was good trout water, but now gone, as you fish this season. Check Gap Creek, Old Fields Creek, Pine Fork Creek, or any creek—they have had it!

George W. Shepard

Good Fishing

DEAR SIRS,

Let me say first that I am a resident of Durham, N. C. attending Seminary in Richmond. I am very proud of my state and especially what the Wildlife Resources Commission does. I am very much a trout fisherman and again I feel our state does better by its trout fisherman than any other state of which I know. But this is not the main idea in my letter. I am writing a "FAN" letter for a stream and the connected project. As a dyed-in-the-wool fly fisherman I am pretty hard put to get much out of the stock trout that fall prey to worms, corn, and dough. But I am an advocate of such projects as the Davidson River that makes stock fishing a great deal more fun. But again this is not the reason for my letter.

Last May when school was out and I had two weeks before I began summer preaching I went to—Creek outside of Old Fort, N. C. I had heard about it for some time, but hadn't put much in it. But now I am a true believer in what you are doing there. I had more fun, caught more fish all on dry flies than ever before in my young life. I kept only four trout: a *beautiful* brown about 13 inches, this one was as close to being a native as they can get, two rainbows about 12 inches and a brook about 10 inches. I released 31 trout, half of which were legal size. It is a beautiful stream and I was only the third person to fish that day. I have never had a finer afternoon.

I did hang one trout that looked to be about 16 inches. When I was checking in the warden showed me a trout that had just been caught by a friend of his that weighed 3 lbs. I have forgotten the name of the warden, but he was a young man about my age and he made my day even better by being so nice. He was an ideal man in a job that has so much to give. He will be another reason that I plan a two-day camping to that stream in May.

I feel that —Creek has to be the answer to the problem of producing good fishing. I don't know what the evaluation of it has been by you, but mine is that it is the greatest thing since the fly rod. I only hope you do more streams in the same way. If you have time I'd like to know how the idea has worked and if any more streams will become a—Creek.

Thank you for doing such a great job, and don't tell every body about —Creek. I like being the only one in a mile of WONDERFUL trout water.

Dave Coffey, Richmond, Va.

Dear Mr. Coffey:

Thank you for your letter discussing the enjoyable fishing trip you had on ..... Creek on the Mt. Mitchell Wildlife Management Area. There are many fishermen who enjoy the thrill of catching a large number of trout; keeping only a few of the larger ones and returning the others to the water to be caught again. In order to follow this concept of returning large numbers of trout to the stream in an uninjured condition, it is necessary that they shall not be permitted to swallow a bait containing a hook and be hooked in the stomach.

On the other hand, there are many fishermen who prefer to keep all of the trout they catch up to the prescribed creel limit. In this case, there is no particular point in establishing a size limit or specifying the types of bait which may be used. We try to provide both kinds of fishing in our public waters in order that each group may find fishing to their liking.

On most of our public moun-

KNOW YOUR PROTECTOR

Philip R. Williams

Wildlife Protector Philip R. Williams was born in Chatham County on April 26, 1937. His parents are Mr. and Mrs. H. S. Williams of Chapel Hill, North Carolina. Mr. Williams is a graduate of Pittsboro High School and attended Mars Hill College.

Prior to his employment with the Wildlife Commission, he served four years in the U. S. Navy, most of which was aboard the U.S.S. Los Angeles in the Pacific. After his military service he was employed by the Coca Cola Company of Durham, North Carolina.

Mr. Williams completed Pre-Service Training School for Wildlife Protectors in January, 1962, and was employed in February, 1962 as Wildlife Protector at Valdese in Burke County. He has completed four In-Service Training Schools since employment.

Mr. Williams is a member of the Southeastern Game and Fish Commissioners, a Certified Hunter Safety Instructor for the National Rifle Association, and is a Petty Officer in the Naval Reserve. He is married to the former Lib Jones of Chapel Hill and has two sons, Phil age 3 and Ken age 2. Mr. Williams now resides near Valdese, North Carolina.

DIVISION ENFORCEMENT RECORD FOR MARCH, 1966

HUNTING & FISHING

Persons checked	29,210
Total prosecutions	356
Total convictions	345
Total cases not guilty	3
Total cases nol prossed	7
Total cases dismissed	1
Total fines collected	$2,998.25
Total costs collected	$2,994.35

BOATING

Persons checked	2,827
Total prosecutions	62
Total convictions	62
Total cases not guilty	0
Total cases nol prossed	0
Total cases dismissed	0
Total fines collected	$268.00
Total costs collected	$581.70

All fines and any arrest or witness fees are paid into the school funds of the counties in which the violations occurred, and no part of the fines or costs collected are paid to the North Carolina Wildlife Resources Commission or its personnel.

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tain trout waters there is no restriction except a daily creel limit of 10 fish within the open season of 7:00 a.m. April 2 to midnight September 5. On some of the streams in our wildlife management areas, however, there are special restrictions concerning open fishing dates, size limits, creel limits, and the type of lures which may be used. We are sending you a copy of the special fishing regulations pertaining to the management areas. This bulletin describes the regulations applying to the various streams and will give you a basis for selecting streams which are managed by the particular regulations you prefer. Please accept our best wishes for many more enjoyable fishing trips.

Very truly yours,
J. H. Cornell, Chief
Division of Inland Fisheries

Pet Snake

DEAR SIRS:

We certainly enjoyed your December article on the brown snake . . . and every issue of WILDLIFE.

A brown snake was given to us on 11-5-65, and was loose in our house for almost a week after escaping from a jar! We placed the snake in an old rectangular aquarium partially filled with peat moss, leaves, a branch for it to climb on, and a jar lid to hold water. The room temperature remains between 68° and 72°. (We have a wire screen over the top of the cage.)

Once after putting three or four earth worms in the cage, we saw the snake eat one . . . smack its lips!

The snake must be a female because curiosity concerning noise and activity in the room causes "her" to **un**-hibernate and look around. About once a week our 15 year old daughter and I take her out of the cage for exercise: handling and crawling on the floor. Part of the time "she" lies beneath the leaves and at times lies curled on top of them.

On 1-23-66 "she" surprised us by completely shedding "her" skin! Is this a common occurrence under the existing conditions?

We thoroughly enjoy our pet as do our friends . . . after they become accustomed to the idea and sight of "her." MRS. N. H. McCOLLUM, JR., LEAKSVILLE

Snake Proof

DEAR SIRS: In a recent *Wildlife* Magazine somebody asked how to keep snakes out of his blue bird houses. Take a piece of tin 18 or 20 inches high and wrap it around his post and nail it tight, galvanize tin will be the cheapest in the long run. If the tin rusts, the snake may be able to hold on to it. I watched a black snake for at least 30 minutes try mine, but he had to give up, and the snake was over a yard long; it will stop almost anything such as cats, etc. LEE PIERCE, CHAPEL HILL.

QUAIL

• **continued from page 19**

The quail we saw were not on the Eli Whitney Community farms by accident, and the same is true wherever quail abound in the state.

Mr. Ferguson and his friends in Alamance County are not alone in their promotion of sound conservation practices. They are among the many all over the state who have learned ,or are learning, that dedicated men, hard work and active participation in state wildlife management programs can insure that your days in the field will not be wasted.

The boy who gets his first gun this year, and the hunters who follow him will be able to enjoy the same kind of hunting we did, and they will owe it to men like Mr. Ferguson, who were farsighted enough to see that small game hunting—like any crop—must be cultivated to prosper. ♦

FOR BASS

• continued from page 11

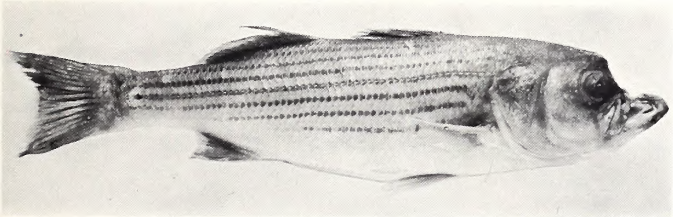
Virginians often call their part of the lake Buggs Island with the Tarheels using Kerr Reservoir. This 50,000 acre impoundment has 800 miles of shoreline. The majority of the lake lies within the boundary of Virginia. However, since both states by mutual agreement honor both Virginia and Tarheel state fishing licenses, all waters accessible by boat from the main body of water can be fished. There are two marinas operating on the lake, one is located at Satterwhite point with the other on the Flemingtown road just off secondary road no. 1371. There are numerous launching areas located over the lake, including Butchers Creek, Sudan Landing, two ramps at Occoneechee Park, Townsville, Eagle Point, Stauton River State Park, Buffalo Spring Park, Grassy Creek Park, Longwood Park. Most all main roads leading to the lake will have launching ramps or secondary roads that do.

After the spawned-out bass come off their beds to end their spawning fast, they go on a feeding binge that would shame a hungry weasel. That's when you want to make your appearance with these starved lunkers raiding the bushes on the points chasing gizzard shad or any fish that's handy. This is the hottest bass fishing time during the year. These fish in doldrums of summer seem to virtually disappear. These largemouth seek deep, cool water in dog days and feed during the night when the surface water is at its coolest.

It's fun to battle the wild bruisers back in the bushes. When you invade their stomping grounds the odds are in their favor and that helps add spice to the challenge; but with these scrappers you need everything in your favor to consistently catch your limit. This usually takes place the latter part of May or first of June. Water temperature plays an important role so watch the thermometer. This is the time when largemouth of all sizes congregate on the points, gaunt and ready to tackle most anything that swims.

More bass seem to be caught off points in the main channel. These lunkers will not tolerate shallow water for living quarters; however when gorging on bait fish they frequent the shallows but like quick access to deep safe water. So when engaging in this great past time and you want bass, get to the point. ⬍

Pugheaded Striper



A pugheaded striped bass, *Roccus saxatilis* (Walbaum), weighing 3 pounds and measuring 19.6 inches fork length, was taken by Sherwood Etheridge in the Roanoke River, N. C., on May 15, 1960. The fish was caught on "cut bait" in the rapids above Weldon, N. C. The specimen, a 4-year-old male, had all the features typical of this abnormality (see photo). It was above the average size (18.3 inches fork length) of normal striped bass of comparable age and was apparently well nourished.

Pugheadedness is thought to result from a germ-cell defect in the embryo, although environmental factors may also contribute. It occurs in several fish species, including brown trout (*Salmo trutta*), carp (*Cyprinus carpio*), white perch (*Roccus americanus*), largemouth bass (*Micropterus salmoides*), and yellow perch (*Perca flavescens*). I collected a pugheaded young-of-the-year American shad, *Alosa sapidissima,* about 4 inches fork length, in the Cape Fear River, N. C., in October 1963.

Pugheadedness is not a rare deformity in striped bass, although to our knowledge none has been previously reported from North Carolina. The specimen from the Roanoke River is in the fish collections of the Zoology Department, North Carolina State University at Raleigh, Raleigh, N. C.

Randall P. Cheek
U. S. Bureau of Commercial Fisheries
Beaufort, N. C.

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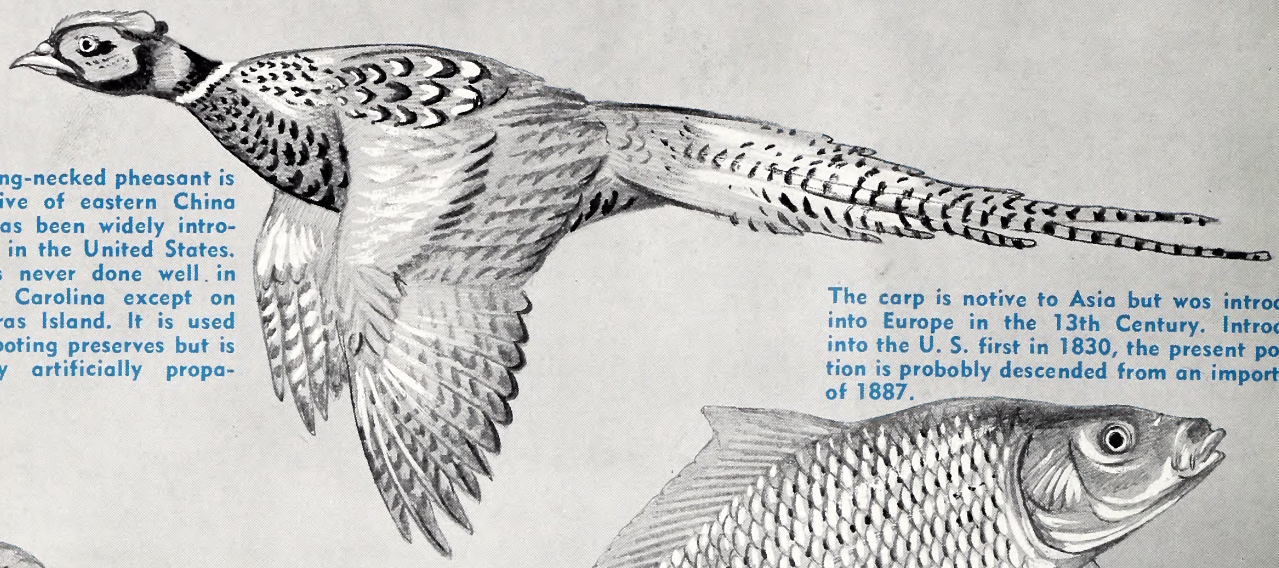
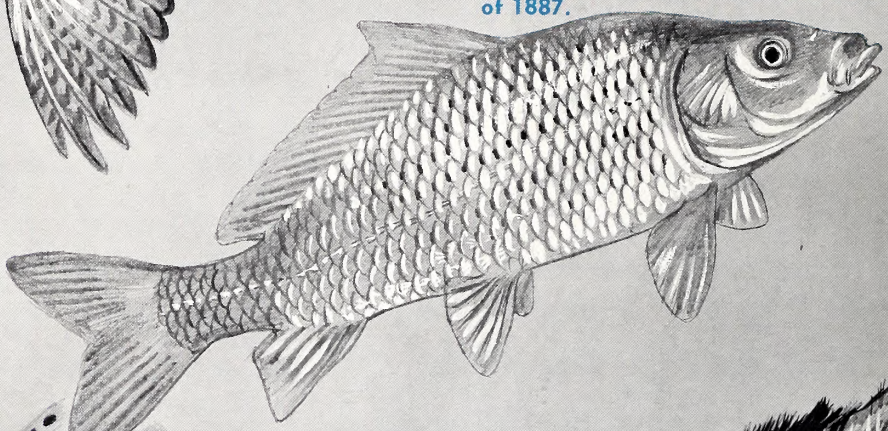
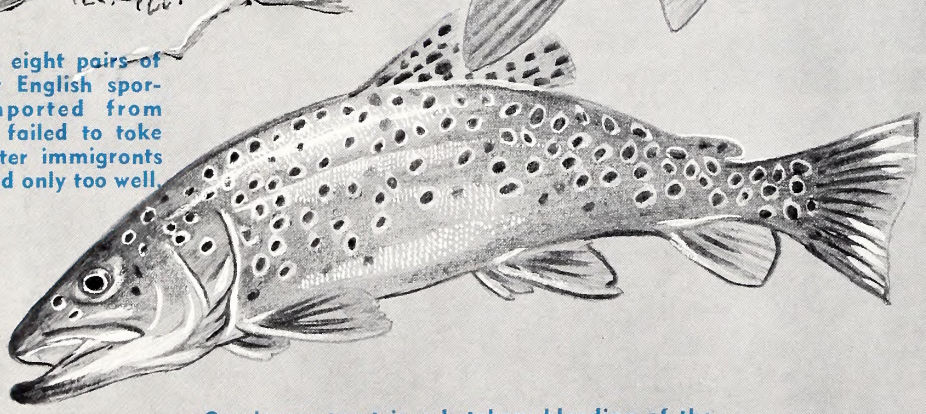


The ring-necked pheasant is a native of eastern China and has been widely introduced in the United States. It has never done well in North Carolina except on Hatteras Island. It is used on shooting preserves but is usually artificially propagated.

The carp is notive to Asia but wos introduced into Europe in the 13th Century. Introduced into the U. S. first in 1830, the present populotion is probobly descended from an importation of 1887.



In 1850, eight pairs of house or English sporrows imported from England failed to toke hold. Later immigronts succeeded only too well.



Our brown trout is a hatchery blending of the German von Behr trout, and the Loch Leven trout imported from Scotlond in 1884. Nonnative wildlife species must be studied carefully before they are introduced into our fields and waters.

As ornery as he looks, the Europeon wild bo was first releoseo in North Corolina in 19 probobly from Prussia. Several strains ho developed, and pure stock may be difficult find. They hove also been established in Te nessee, Colifornia, and New Hampshire.

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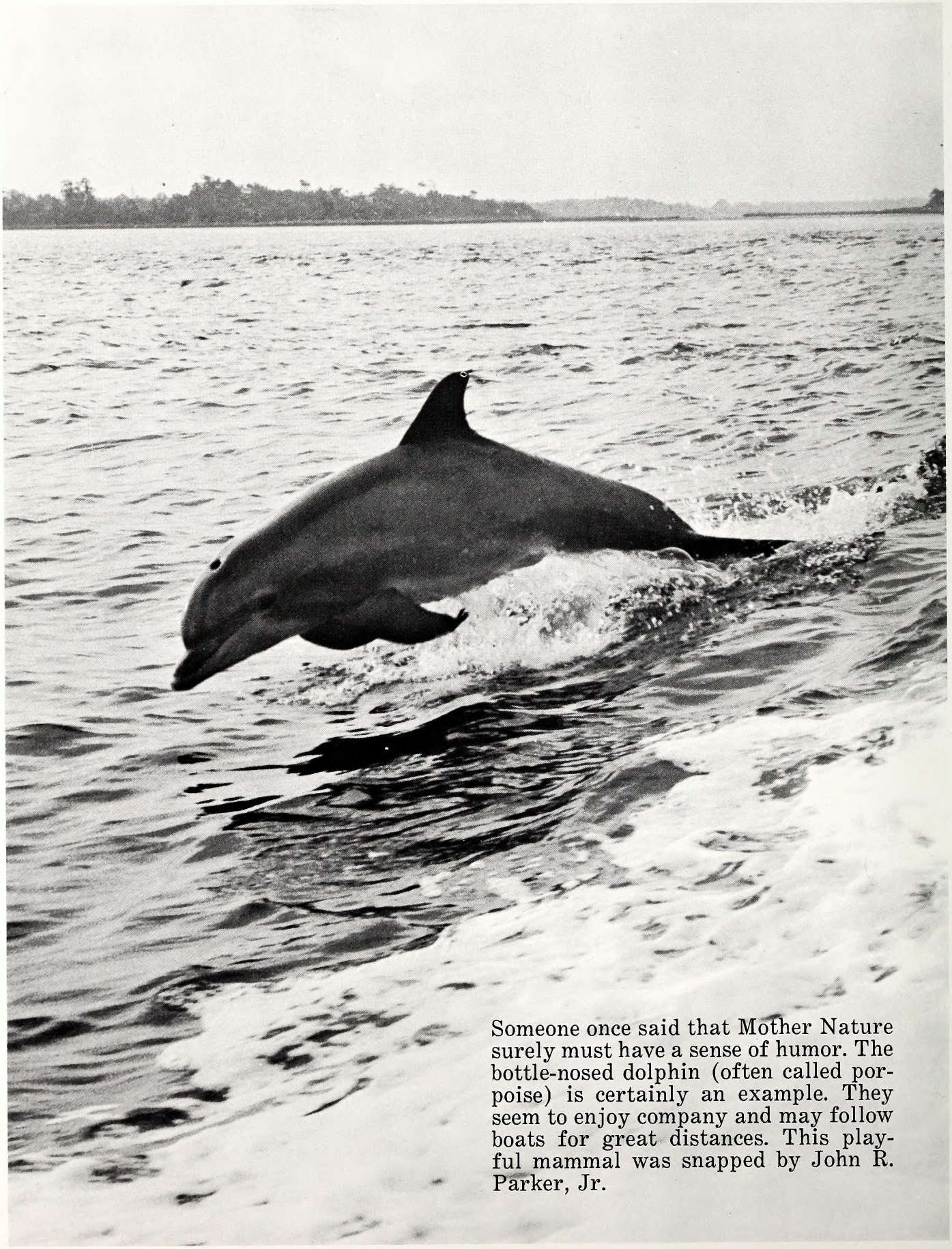
Wildlife IN NORTH CAROLINA

JULY, 1966



Someone once said that Mother Nature surely must have a sense of humor. The bottle-nosed dolphin (often called porpoise) is certainly an example. They seem to enjoy company and may follow boats for great distances. This playful mammal was snapped by John R. Parker, Jr.

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Wildlife IN NORTH CAROLINA

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JULY, 1966 VOL. XXX, NO. 7

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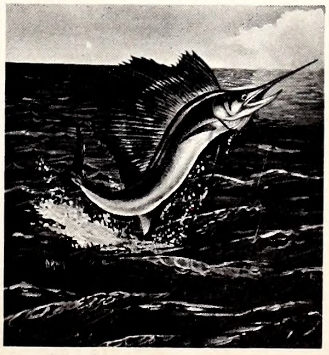

Midsummer angling in inland freshwater can be a bit slow. But out where the deep blue of the Gulf Stream mingles with the green in-shore waters, the saltwater gamesters are ready. You won't always tie into a sailfish like the one pictured on this month's cover, but if you do, you're in for an aquatic acrobatic act you won't soon forget. An Atlantic sail of 50 pounds is about average. Watercolor painting by Duane Raver.

JULY 3rd to JULY 9th

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WILDLIFE IN NORTH CAROLINA recognizes the need for close cooperation between State and Federal conservation agencies and the people who hunt and fish—to bring about a restoration of our renewable resources. The Editor gratefully receives for publication news items, articles, and photographs dealing with the North Carolina out-of-doors, but reserves the right to reject materials submitted. Full credit is given for all materials published.

* * *

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Wildlife circulation June, 1966, 99,777.

Elizabethan Falconry

by Joel Arrington

MAN has been amusing himself with wildlife of various kinds at least since the time of our earliest historical records. Falconry is one of the oldest sports which employs animals for sporting purposes for there is evidence that it was practiced in China at least 2000 years before Christ. Some of the oldest Egyptian murals depict falcons in hunting regalia. The sport spread over Europe with the Roman domination and came to England somewhere around the ninth century. There falconry gained in popularity so that eventually social customs began to regulate the sport.

Hawking contributed significantly to the English language and many of its terms still remain today. By the twelfth century, falconry had become so popular that its technical terms were habitual to ordinary conversation. The square frame on which hawks were carried was called a *cadge,* and the servant who bore it was called a *cadger*. To *man a hawk* was to tame it. The female of any species, but particularly a peregrine, was called a *falcon.* A male was a *tercel* or *tassel,* and a wild hawk was a *haggard* or *passage* hawk. It became the custom to refer to falcons in the feminine gender since the females usually made the best hunters.

A falcon *stoops* when she descends with closed wings from aloft upon her prey to kill it with her beak. A hawk that *binds* seizes prey in the air and clings to it in a fall. She *makes her point* when she rises and hovers over the quarry which has escaped to cover. A hawk waiting for the quarry to be flushed hovers at a certain *pitch* or height. The terms were well-defined and concise, and, in the days of yore, a good falconer was expected to use them accurately.

Those who have written of falcons over the years have divided them into various groups, some assigning ten classifications, others eight or nine. But falcons which are best for hunting may be grouped under two heads—long-winged and short-winged. The long-winged group includes the gyrfalcon, the merlin and the peregrine, while the short-winged group contains the goshawk and the sparrow hawk, among others.

The gyrfalcon is larger than any other falcon and its fierce temper makes it difficult to reclaim after a flight. This is a bird of the arctic, but it ranges south to Great Britain and central Russia in Europe and as far south as New York and eastern Pennsylvania in North America.

The merlin, or pigeon hawk, is a small variety. For that reason, and because of its good manners, in Elizabethan times, it was considered to be especially suited for ladies. It was admired for its courage and was said to be an excellent hunting hawk if well-trained and attended. It has a quick flight, is very bold, and eagerly pursues its game. Its chief quarry is birds up to robin size, but it will also attack and kill birds larger than itself.

The standby of the falconer—in England and in other countries—was the peregrine, a bird of almost universal distribution. It is a common breeder on English coasts and as the autumn migration gets underway, is widely distributed over Europe. This hawk is still prized by falconers and is particularly admired for its fast, powerful flight.

The most shy and coy of all falcons is the goshawk, a bird of the northern woodlands. It was said to be better suited for a woman's handling than for the authority of a male master, being apt to remember any unkind or rough treatment. The goshawk takes a stand on any tree, and on sighting its prey, will fly from

A natural-born hunter, as are many of his relatives, the duck hawk will attack many kinds of birds. This one stands over an unidentified meal. Note the large, efficient-looking talons. At the other end of the scale is the meek-appearing sparrow hawk, so named because of its size rather than its quarry. This one (right) is tethered to a stout line kept on an old fly reel. When its training is over, it may be ready to hunt without the retrieving line. Note the heavy glove!

its perch with great fierceness and strength. This hawk earned a reputation for seldom missing its game.

The short-winged hawks were trained differently from the long-winged variety, being at first more timid and difficult to handle. They were generally carried bareheaded, and always so when out hunting so that they might dash from the fist in sudden pursuit of game. In India, the sparrow hawk was carried in, not on, the hand and was "bowled" at the quarry in an underhand manner. This was said to be a most deadly method for taking quail.

In Elizabethan times, hawks were assigned by custom to royalty according to the bird's superiority as a hunter. An emperor hunted with the eagle; to a king went the gyrfalcon; to a prince, the peregrine; and to lesser nobility were given other long-winged hawks termed "nobel". The short-winged or yellow-eyed hawks, because of their inferiority and since their masters were usually commoners, were termed "ignobel."

In Shakespeare's time, hawks were also classified according to age. Turbevile, an early writer on the subject, notes that hawks were taken and reared entirely by hand from the *eyrie,* or nest, were called *eyasses. Rammage hawks* were birds which had left the eyrie and flown at large, hunting for themselves until the end of August. Such hawks are more difficult to handle than the home-reared *eyas.* In addition, there were *soar hawks*—wild hawks of the first year caught between the end of August and the end of November, the period of autumn migration in England. These are the *passage hawks* of modern falconers and they have been considered in all times to be the best variety of hawk to train, having been wild long enough to be excellent at flying and capturing wild quarry, yet not so old as to be shy, stubborn and difficult to train.

Hawks were captured in several ways and at any season. They were taken from the nest when they were *eyasses,* when they were branchers (old enough to leave the nest and perch on nearby branches, but not old enough to fly), or when they were *soar hawks.*

Some species of nocturnal birds of prey were used to capture hawks. Sparrow hawks were taken with the smaller owls, while goshawks, merlins and even larger birds were often captured with the great horned owl. But the most widely-used method of taking hawks was with nets, called *vrines.* They were made of small thread, dyed blue or green so as to frighten the hawk as little as possible.

Nest-robbing was another popular method. A nest was located

in a tall tree by the presence of bones and plumage of eaten birds around the trunk. It was watched in early morning or evening to determine if the female was incubating the eggs. If the male was bringing food to the female, eggs were sure to be in the nest. Having found the tree, the falconer climbed it about noon and looked into the nest, being sure not to touch either the nest or the surrounding branches, for any scent was thought to make the female abandon her young permanently. Modern falconers know that the female will not leave her young even if they are taken from the nest, provided they are returned in a short time. Young falcons were taken when they were about ten days old, and fed meat and live birds until they became hard-feathered. Nest-robbing was not considered to be the best method because the young birds, not being naturally fed by their mother, were particularly susceptible to disease.

In modern times other methods for capture have developed. Falconers employ an ingenious method for catching sparrow hawks. A small wire cage is constructed just thick enough from top to bottom to house a mouse. The top of the cage is covered with a gill net. As the falconer drives down rural roads, he looks for sparrow hawks perched on telephone wires. When he sees one, he tosses the cage containing the mouse out the window of the car and drives on. The hawk eventually sees the mouse, dives at him, and catches his feet in the net.

Three hundred years ago, when a hawk was caught, it was immediately *seeled.* A needle with fine thread was drawn through the lower eyelid, which consists merely of insensitive skin, passed over the crown of the head and down through the lower eyelid of the other eye. Drawing the string tight closed both eyes by drawing the lower eyelid up over the eyeball.

In addition to seeling, a hood was placed over the hawk's head to insure perfect quiescence when perched on the fist. Seeling was intended as a temporary measure to allow the hawk's eyes to adjust to the contrast between the darkness of the hood and the brightness of daylight. Now the hood has become as familiar an object in falconry as the bird itself.

In Shakespearean times, the training process was the most important and difficult problem of the hawker, and that remains true today. For hundreds of years the methods of training a hawk have remained basically the same.

Probably few other outdoor sports have retained their ancient form as long as falconry. Both fishermen and hunters today use airboats, four-wheel drive vehicles, airplanes, and even motorcycles in pursuit of game. Archers employ modern metals, plastics, and efficient sights to increase the quality of their bows and arrows and to achieve greater accuracy. Natural baits are not as effective in catching fish as correctly-used artificials. But it still takes just as much time, skill and patience to train a falcon today as it did when Isaac Walton wrote *The Compleat Angler* in the days of merrye olde England three centuries ago.

The first step is to put on the *jesses* or short straps of leather by which the hawk is held, and which always remains on it. Often, little silver rings, called *varvels,* are attached to these straps.

With the hood, jesses, and varvels provided, the work of taming the hawk begins. It is placed on the fist and stroked with a feather or hand until it becomes accustomed to such treatment. The hawk will *bate* (fly) from the fist, but it must be patiently replaced until it becomes docile and begins to feed on the piece of meat held in the trainer's hand. Sometimes the falcon is tamed by fatigue, but never by starvation. It is watched or kept awake at night until it settles down to docility by sheer weariness. Bells are sometimes attached to the bird's feet to facilitate an easy recovery if the bird flees into thick underbrush in an attempt to escape its handler.

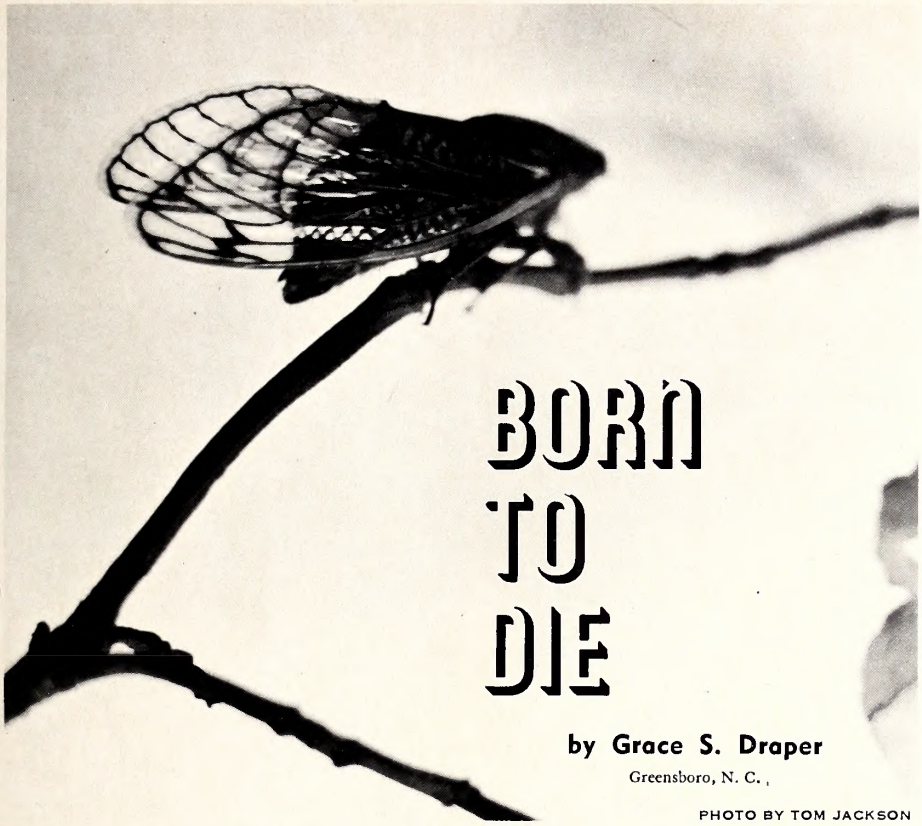
When the hawk reaches the "bell" stage, the last job of training remains—that of teaching the hawk to fly to game, and not leave it when the falconer approaches. For insurance, a light line is tied to the falcon's foot during the training. Three hundred years ago, further training could take either of two courses depending upon variations in temperament, style and power of flight among falcons of different species.

One method, called *flight at high mountee* in the seventeenth century, involves the bird flying directly off the fist as the quarry rises or passes over at a distance of under a quarter-mile. The other method was known as *river hawking.* It was the more popular of the two methods in Elizabethan times. By this mode, the game was held by a pointing dog while the hawk was released to wait at some height over the head of the falconer from where it descended at a terrific speed upon the prey when it was flushed. The first method requires a swift and powerful bird that is able to overtake its quarry, while the second system requires highly trained hawks of greater docility and longer experience than those flown directly from the fist.

Falconry is still practiced in most civilized countries of the world, but the sport is not nearly as popular as it formerly was. Few have the time, it seems, to capture, tame, train, and hunt falcons. Most states, including North Carolina, do not permit the taking of game birds or protected birds by means other than those listed in their regulations. This means that falcons can be legally used in North Carolina only on unprotected species. Falconry itself is permissable, but not for the taking of protected species.

Most hawks—and all falcons—are protected by federal law and state law. Only the Sharp-shinned hawk and the Cooper's Hawk may be legally killed or taken. However most state game authorities will issue a permit allowing a potential falconer to catch one of the falcons and hold it captive. Check with the Wildlife Commission's Division of Protection before embarking on this sport. ◆

North Carolina State Library
Raleigh



BORN TO DIE

by Grace S. Draper
Greensboro, N. C.

PHOTO BY TOM JACKSON

IT all began about noon on a hot North Carolina day when my two sons ran in to tell me excitedly that they had found another cicada shell to add to their collection.

"And this one is alive, Mother!" one exclaimed.

Leaving the kitchen quickly behind (as this new venture promised more interesting fare), we all gathered around the tree and stood patiently watching as the strange green creature worked its way out of the split in the head and top of its drab brown shell, to the attendant ohs! and ahs! of its several observers. This was a slow process, and a rather tiring one, too, for the insect, as it would work a while and wait a while alternately, as it proceeded. The emergence of the limp, short wings brought especial exclamation from the gathering crowd of little neighborhood boys, who were inadvertently having a Nature study lesson.

The cicada was a lovely pale green color, with enormous eyes and eye-effect coloration on the top of its head. By now the insect had progressed from the lesser pronoun "it" to a definitive "he".

As he gradually extricated himself from the shell, he expanded in size, so it would have been impossible for him to ever return. With one final pull, he cast off the shell in finality, and began to slowly test his front feet alternately, preparatory to climbing up the tree trunk. He had spent from 13 to 17 years underground preparing for this moment. It had taken him over an hour to emerge from his shell. It would now take him several more to expand and dry his limp, wet wing-stubs into gossamer multicolored wings, and for his body to harden protectively. His life expectancy, if he lived to mature into a colorful, buzzing cicada in these few short hours, could only be a few months!

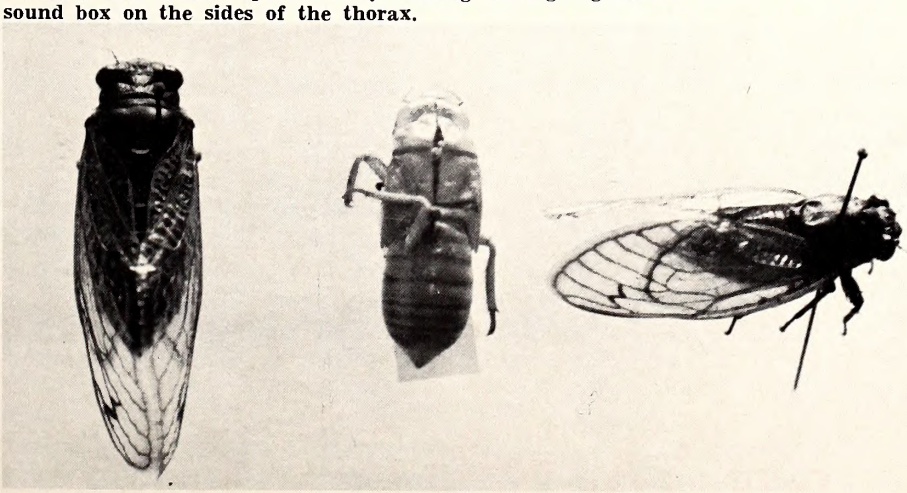
One of the marvels of Nature now began to occur as the insect's limp, wet wing structures began to unfold and elongate before our eyes, and to stiffen slightly. He now appeared to be a lovely, plump, pale green morsel sitting on the tree trunk, having moved only a few inches up the bark from his shell, left behind, to be added to my son's collection.

The group of boys, having just about had their interest span satisfied as to this curiosity of Nature, began to wander away, leaving the cicada unattended on the tree.

And at that moment, when no one was actually watching the insect, down swooped a blue jay! As he rapidly flew upward, he took with him our cicada, a juicy morsel for his waiting baby bird in the branches above. We on the ground below were left with a confused set of mixed feelings of consternation and helplessness at what had happened!

Yet this simple poignant drama had been a revealing lesson to us in the ruthlessness of Nature, and the constant struggle for survival of all its creatures.

Shown almost life-size are two poses of the adult cicada and a case from which one has emerged. Sometimes called "locusts", these noisy insects begin their throbbing buzzing during midsummer. The sound is produced by rubbing the legs against a sound box on the sides of the thorax.



Nasturtiums for the Rabbits

by Katherine W. Mosley
Arlington, Va.
PHOTOS BY JACK DERMID

HE was a large one. He was well-fed and glossy. His white powder puff tail twinkled against the rock-terraced flower bed. By his shape and coloring he looked like a million other cotton-tail rabbits but this one was methodically mowing down a row of tender, tasty, nasturtium plants, well past the seedling age but not ready to bloom.

"You, you, Gourmet," I shrieked, "get out of there and go eat clover!"

He quickly hippety - hopped away with a reproachful look at me over his shoulder.

The next weekend when we drove to our country home from the city we found young marigolds nipped to the ground and an old granddaddy of a groundhog loped nonchalantly over the bank. My husband laughed, "We can't win. They're moving in. First the lettuce and now the flowers. Until we are here to stay they know they have it made with the house empty all week."

"Why don't they stay in the woods where they belong?" I stormed.

But we both knew that most of our plentiful, native wild animals don't really belong in the deep forests any more. They long ago adopted man and have been dependent on him ever since. Contrary to popular belief, man's activities have not always been detrimental to wildlife and some native species have benefited tremendously.

Rabbits are a part of our American heritage. From the earliest settlement of the United States, cottontails were an abundant, valuable source of food supply. Hunted with guns and dogs, snared and trapped, one wonders that they survived. Even today, very large numbers, running into the millions are killed yearly. How can they still be so numerous, scurrying, like toys from a child's picture book, into the briary tangles where they have secret runs?

Our own flower garden holds part of the answer. Cottontails prosper where man lives in spite of his death-dealing weapons. As the pioneers opened up the heavily wooded, virgin timber land, the rabbit-opportunists moved in closer to the log cabins. They swarmed into the borderlands that are not quite fields and not quite wilderness to flourish in hedgerows, brush piles and woodland borders. They left behind in the deep, dark woods many of their natural rabbit enemies such as the great horned owl, who stayed with the giant trees; the bobcats, the weasels and the foxes. Happily prolific, the cheerful rabbits thrived in the tall grass and among the briars and brambles in the neighborhood of cultivation.

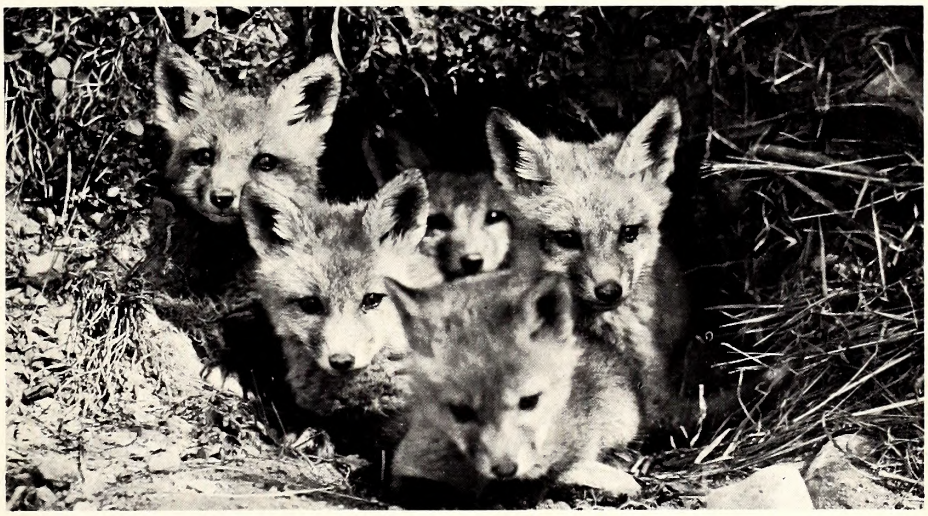
With the rabbits came the self-important woodchucks with their polite aplomb. Soon they too were familiar inhabitants of fields and grassy hillsides, especially where bordering woodland offered safe retreats. Burrows were dug under stone walls, rocks and ledges. They quickly learned to establish quarters near newly planted apple orchards. Green meadows of clover and lush garden produce provided by man were decidedly more desirable than the inferior vegetation and stunted brush found under the extraordinary height and spreading branches of the trees in the forest they had left.

Skunks, oppossums and foxes followed the woodchucks out of the deepest woods. The foxes and skunks immediately took over many of the woodchuck holes. The woodchucks seemed to have shrugged and just moved on to another site to dig again. All of these animals prospered and thrived as man's furry neighbors. The skunks preferred farming belts to any other territory for seldom did his worst enemy, the horned owl, sail across an open field with deadly talons ready. Nor did the bobcat, the wolf or coyote often prowl too close to the scent of man.

Wherever the foxes settled they showed great intelligence and alertness in meeting the requirements of their surroundings. They became not quite friends of humans but at least tolerant and appreciative of the protections offered to them by man. As for the opossums, there was nothing subtle about their methods. They decided early they preferred any kind of food that people ate. From a nearby kitchen if possible. Raccoons also found this new way of life good as they left their dainty hand marks along lake and river borders.

The bare-floored virgin forests had little low growth and only scanty and dwarfed vegetation for food for the grazing animals. When man started cutting trees and making clearings, he changed the whole pattern of the land. Weeds, brush and grass slowly took over what was once a completely shaded area. The white-tailed deer were soon attracted to the desirable new feeding ground. Also the second growth

Although man is the greatest predator of most game species, he also is responsible for maintaining their numbers in the face of constant "re-arrangement" of Nature. Opossum, rabbits, and foxes have learned to cope with the ways of man.



wooded areas made splendid brushy deer locations especially if nearby a farmer had planted fields to yield fodder of a richness the deer had never known.

The rollicking gray squirrels probably were completely happy in their great trees under which few men had walked. Perhaps it was curiosity, restiveness or a migration to find fresh food supplies after a failure of a nut harvest in their native trees that brought the squirrels into the neighborhood of pioneer man. Who, as it turned out, became an enemy. Extremely cunning, the squirrels out-witted some of the finest pioneer marksmen and found that partially cleared fields with old oaks or hickory trees seemed to suit their needs as well or better than the more heavily wooded areas. The crops of nuts were more constant in the thinner forests.

It is man's instinct to pull tight his property lines. Soon fences began to appear to clearly mark possession. A good split chestnut rail fence was a farmer's hallmark of distinction. To these fences fluttered the quail, and the grouse. Seeds and insects spread a bountiful buffet. The weedy corners and edges of the fences were perfect for resting and nesting cover. When the farmer plowed his fields, worms slithered to the surface to be found by the robins and flesh-hungry birds.

Other birds of the deeper woods winged out to find vines loaded with berries in the new clearings, now sun-filled. Wild plum thickets, rich in fruit, suddenly became choir lofts for bird songsters. Crows learned that these people planted corn, like the Indians, but they put up strange dummies to guard the plants. Inevitably trees died and rotted and to these came the great family of woodpeckers with their wild, edgy cries.

Once in our states the bison and elk walked proudly through the valleys. Once in our states the cougar and the wolf stalked the hills. Once the passenger pigeons and the majestic eagles made dark the arched blue sky. They are all gone now, either extinct or very few in numbers. It seems that man proved himself master in his relationship with the birds and beasts, with the trees and with the earth and the waters. It was only those birds and animals which were able to adjust to the environment of man who were able to survive.

Today rabbits dine in country gardens, groundhogs rear up to watch traffic along the highways before they head to their burrows close to man-made fields of bounty. Raccoons and opossums leave their neat, lacy, foot-prints in the sands of streams and rivers. A pileated woodpecker screeches as he flings himself across the sky. Unlike the ivory-billed woodpeckers he has survived and in our woods seems to thrive. A white-tailed deer more graceful than a ballet dancer pirouettes off into the dark, green forest.

It is indescribably sad to even consider how barren and desolate our countryside and lives would be if these, our neighbor wildfolk, were to be no more. Do have another nasturtium, Br'er Rabbit. ◆

Creel Census - 7 The Largemouth Bass

by Dr. Frederic F. Fish
Asst. Chief, Division of Inland Fisheries

OUR slide down the totem pole of numerical importance in the statewide fish harvest from the inland waters has now reached the largemouth bass—the golden boy of the artificial-lure enthusiast and the darling of that group which the late Governor "Alfalfa Bill" Murray—himself a catfish devotee—used to call the "silk-stockinged" fishermen.

The infrequence with which the largemouth was encountered in the creels tallied during the Statewide Creel Census unquestionably far understates the true popularity of this fish. Whereas numerically, the largemouth bass contributed but 3.6 per cent of the rod-and-reel harvest from the inland waters, certainly more than the indicated one angler in 30 is *interested* in catching one! Perhaps the true popularity of the largemouth would be better measured by the hours and hours of effort expended by the unsuccessful angler who has yet to hook his first one.

Even Currituck Sound, widely acclaimed as really *good* largemouth fishing water demands, on the average, one hour and four minutes of fishing by the unguided angler before yielding a largemouth bass of legal length. This low level of fishing success apparently does not deter the true bass fisherman. He will return to it time and time again for bass, yet he is the same man who, when fishing for sunfish, gives up and goes elsewhere if nothing happens during the first ten minutes. Truly, bass fishing demands of its avid disciples a psychology all its own—not to mention a mastery of fishing techniques unsurpassed by the demands of any other fish.

Perhaps because of these facts, the largemouth—far more than any other fish—seems to attract the "expert;" the chap who honestly gets just as much kick from dropping an eighth-ounce plug exactly on target in the center of a three-inch hole next to a tree root sixty feet away, as he does from hooking a two-pound fish. Small wonder it is then that a very high percentage of largemouth bass is taken on artificial lures. The percentage of largemouth taken on artificial lures far exceeds that of the mountain trout so taken and, for some unknown reason, significantly exceeds that for the smallmouth as well.

The largemouth is not taken uniformly over the State. As the data summarized in Table 10-A show quite clearly, most of the largemouth are taken from the coastal waters north of the Pamlico River—with a second major catch being taken from the Catawba River reservoirs of District 8. Districts 1 and 8 account for well over one-half of all largemouth taken from public waters with the remaining 45 percent being caught, more or less uniformly, from the waters of the other seven districts. The fact that the largemouth bass, even in areas of its comparative abundance, numerically remains a rather scarce fish is apparent from the data of Table 10-B.

The largemouth of District 1, for example, where over one-third of the entire statewide catch of largemouth is made, still accounts for but four percent of all the fish landed in that district by rod-and-reel.

The data of Table 10-C reveal the largemouth sports fishery to be preponderately a casting-rod-artificial-lure proposition for 40 percent of all largemouth caught were landed on this gear-lure combination. Artificial lures, propelled by casting or fly rods, accounted for 47 percent of all largemouth landed and this is the only statewide fishery wherein artificial lures account for anywhere near one-half the total catch. In this respect, the largemouth bass is a unique fish or, as is probably more accurately stated, the largemouth bass angler is a rather unique fisherman!

Where to try fishing for the largemouth? Accepting the fact that even the best waters will yield, on the average, about one legal bass for each hour of fishing, the following waters can be recommended to the angler wishing to try his luck at hooking a largemouth bass:

District 1: Chowan River, Currituck Sound, Arneuse Creek, Cashie River, Kitty Hawk Bay, Lake Mattamuskeet, Pasquotank River, Perquimans River, Sawyers Creek, Suttons Creek, Yeopim River, Merchants Mill Pond.

District 2: Bear Creek Lakes, Blount Creek, Old (Tar) River, Tar River, White Oak River.

District 3: Gaston Reservoir, Jacksons Pond, Lake Wheeler.

District 4: Lower Cape Fear River, Greenfield Lake, Hodgins Pond, Lockwood Folly River, Shoeheel Creek, Lumber River.

District 5: Upper Cape Fear River, Chub Lake, Creedmore Lake, Eno River, Lake Michie, Stoney Creek.

District 6: High Rock Lake, Lake Norman, Tillery Reservoir, Badin Reservoir, Catawba Reservoir, Richardson Creek.

District 7: Lake Norman, New River, Salem Lake, Catawba River, Ararat River.

District 8: Catawba River and Reservoir, Lake Hickory, Lake James, Lake Lure, Lake Rhodhiss, South Fork Catawba River.

District 9: Santeetlah Reservoir, Lake Adger, Skyland Lake. ◆

TABLE 10-A
THE PERCENTAGE OF THE TOTAL STATEWIDE LARGEMOUTH ROD-AND-REEL CATCH TAKEN IN THE INDIVIDUAL DISTRICTS

District	Percentage of Statewide Catch
1	35.6
2	8.7
3	8.1
4	5.0
5	4.0
6	8.8
7	7.0
8	20.1
9	2.7

TABLE 10-B
THE PERCENTAGE OF THE TOTAL DISTRICT CATCH BY ROD-AND-REEL CONTRIBUTED BY THE LARGEMOUTH BASS

District	Largemouth Bass
1	4.4
2	3.6
3	3.5
4	3.0
5	2.3
6	1.8
7	2.7
8	7.0
9	2.0

TABLE 10-C

BAIT Gear	NATURAL BAITS	ARTIFICIAL LURES	BOTH	TOTAL FOR GEAR
CANE POLE	14.7	0.5	0.8	16.0
FLY ROD	1.9	6.7	1.1	9.6
CASTING ROD	8.7	39.9	10.0	58.6
2 LINES	1.7	1.9	11.4	15.0
3 LINES	0.1	0.0	0.3	0.4
TOTAL FOR BAITS	27.0	49.0	24.0	

DEPT. OF CONSERVATION AND DEVELOPMENT

Although angling for other species often requires as much or more skill than bass fishing, there is a special fascination about the bass that keeps us coming back time and again. This angler has picked up a medium-sized Currituck Sound largemouth.

Take a Boy Fishing

by Bob Gooch

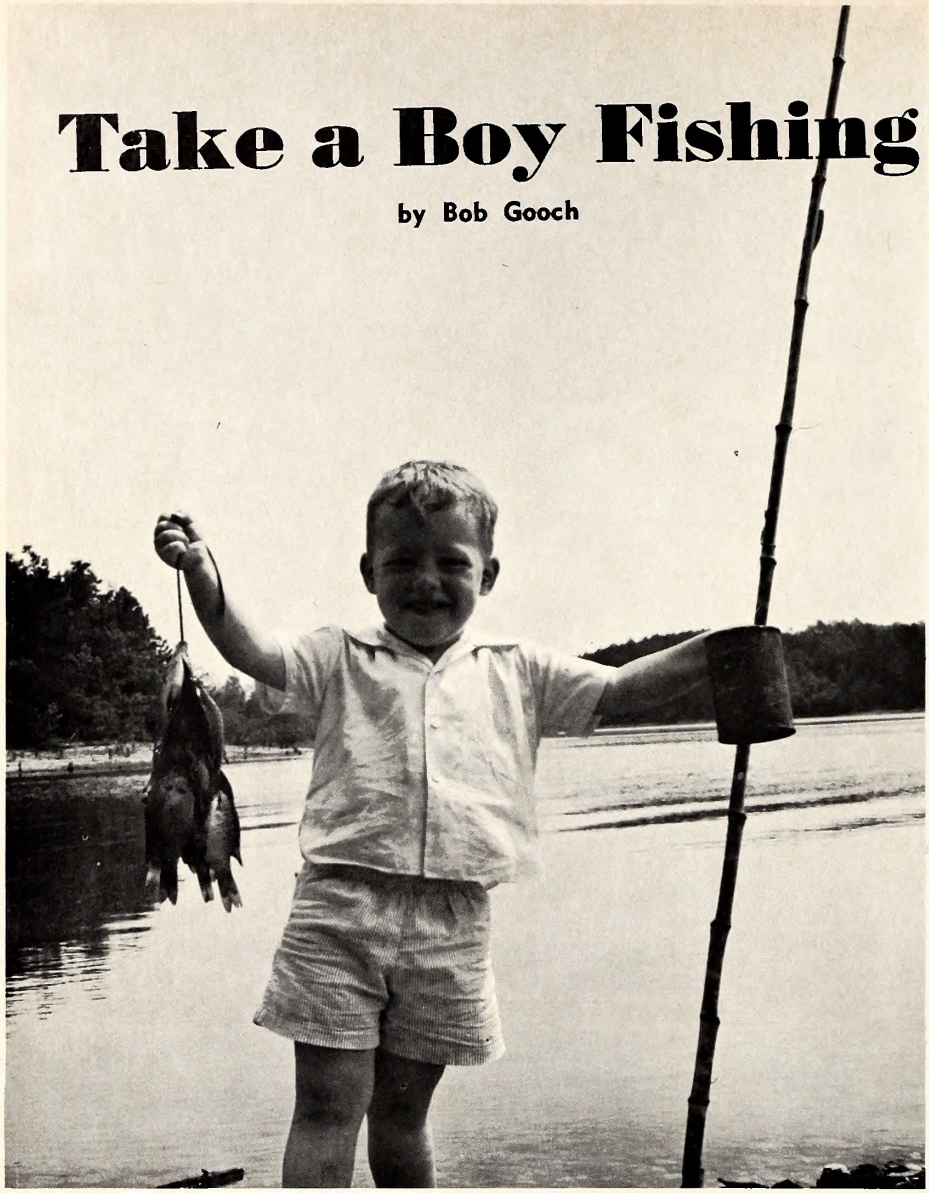


PHOTO BY DON BAKER

PHOTO BY BOB GOOCH

Lawn sessions with the proper tackle will get the boy off to the right start. It will take time and patience.

I am indebted to Hurley Campbell for this title. Hurley is editor of *Southern Outdoors Magazine,* and one of his favorite slogans is "take a boy fishing." He doesn't claim the authorship of this sound bit of advice, but as an outdoorsmen and the father of two husky boys, the words hold dual meaning for him.

With my offspring limited to two delightful daughters, I am not the authority Hurley is—even though my gals love the outdoors. With them and their mother I have camped, hiked and boated over much of the United States and Canada, and God willing, we plan many more such trips.

Maybe it is my fault, but my gals do not fish. However, nine nephews, ages 4 through 15, afford me many opportunities to take boys fishing, and I do whenever I can.

A typical case was a week's visit by Kerr McCutcheon, 4-year old son of Dr. and Mrs. William B. McCutcheon, Jr. of Durham. I am not sure who planted the thought in his young mind, but he came with a singleness of purpose. "Uncle Bob is going to take me fishing." Kerr is energetic and full of curiosity, and from him I learned a good deal about taking boys fishing—particularly those of preschool age.

Kerr's surgeon dad is an ardent outdoorsman and his son's activities have by no means been confined to the city limits, but I did not know how far young Kerr had progressed in the fishing world; so we started off with a lawn session.

The simplicity of a light cane pole is ideal for teaching young people to fish. There is no need to complicate the fun, but a few casting lessons developed familiarity and a knack for handling fishing tackle. They also start a young man on the road toward the finer aspects of angling, and arouse an interest in fly fishing and casting.

A messy backlash can put a damper on a casting session so I set up a spinning outfit. Attaching a casting weight, I gave the outfit to Kerr and we went to work. It was a tedious process, but his expression of delight the first time the weight sailed effortlessly across the lawn was worth it.

The fish for a "boy trip" should be fairly easy to catch—moody bass and evasive trout can come later. It should be colorfully marked and plentiful enough to insure action, and while catching it should not require complicated angling methods, it should be capable of a fair fight. Check

PHOTO BY BOB GOOCH

A boy's interest may lag after awhile in the boat and you may have to catch a fish or two to keep him going. Don't overdo the first trip or two, and be prepared to go home early.

Remember the sun gets hot, whether at the beach or farm pond. Watch out for sunburn; don't ruin the fishing trip.

the requirements and the spunky little bluegill will score high on all counts.

I decided to take Kerr bream fishing.

The bluegill is a versatile fish. They inhabit most streams, but stream fishing is a litle rough for a boy. The same is true of large impoundments. They usually offer good bream fishing, but on big waters a rough sea can whip up in a matter of minutes. Fishing rights on a mill pond near my home give me a quiet and delightful spot for quick fishing trips. It contains bass and pickerel and also a fine supply of fat bluegills, and is ideal for boy fishing trips.

Like most mill ponds this one can be fished from shore, but this limits mobility, and ashore there are many things to detract a youngster's attention. And ashore there may be snakes and perhaps nests of stinging insects to be avoided.

A boat answers the need for mobility and removes the boy from the possible danger of snakes and insects. Limited to the confines of the boat, the young angler is more likely to concentrate on the work at hand—namely catching some bream. He is also easier to keep an eye on, and a flat bottom boat on a quiet mill pond is about the acme in boating safety. Finally the boat adds another dimension to the outing and is accepted as part of the sport. Impress on the youngster the necessity of a comfortable life jacket.

A boy is not going to sit still very long, even in a boat. So plan a fairly short trip and choose the time of day when fishing is likely to be best. I don't recommend dragging a 4-year old out of bed at the crack of dawn, but there is nothing wrong with late afternoon or early evening. These are prime fishing hours.

Plan to do very little fishing on your own. You won't have time to do much except serve as the most underpaid and overworked guide of the season. Beside being lifeguard and oarsman, you have to locate the fish, bait the hooks and string the fish. If the action gets slow you may have to catch a few just to keep it interesting. Encourage the youngster to help and permit him to do what he can on his own. He will develop rapidly, but at the age of 4, a child expects most things done for him.

The boys of 1966 will be the men of 1986. In their hands rests the future of our outdoors. Conservation classrooms and workshops go far in instilling an appreciation for our outdoor heritage, but they leave a certain emptiness that only outdoor experiences can fill. A boy who has thrilled to the strike of a fish, warmed to the tug at the end of his line, and viewed with pride a good catch, returns to the classroom with a new respect for conservation. A boy is objective. If conservation preserves these pleasures of life, he is for it.

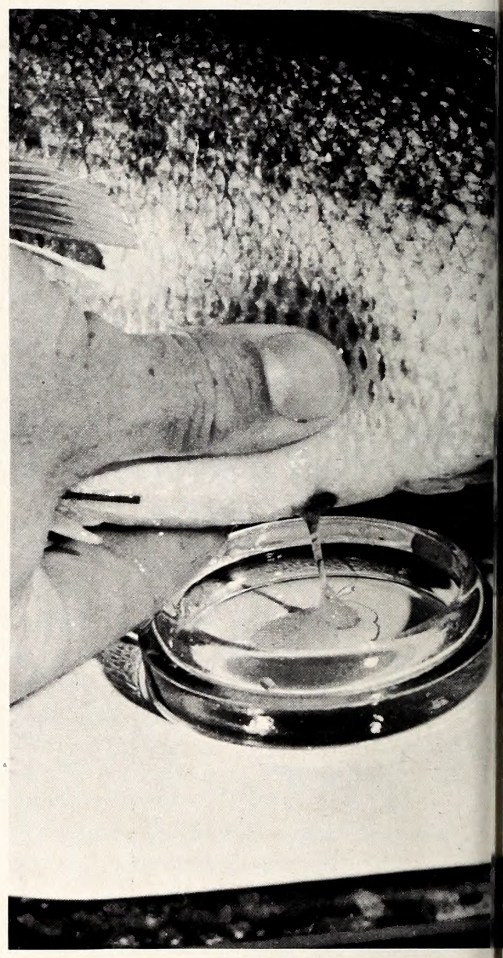
Taking a boy fishing can be a delightful and satisfying experience. If it were not so I would not have undertaken this feeble attempt at writing.

The fruits can be immediate as well as far reaching.

Kerr returned to Durham after his week's visit, and it wasn't long before the postman delivered his thank-you note. Like his fishing it was crude, but the message was clear. Kerr went home and took his busy dad fishing! ⬍

The North
Spo

Graduate student Clair Stalnaker examines bluegill eggs in a genetic study. Dead eggs are removed to prevent development of fungus. Below, plastic pools serve as "test plots" for many fish breeding experiments.



Artificial stripping and fertilizat
tive breeding experiments. Here,
mouth bass. Eggs can be fertiliz
from a male bass, or hybrid cross

FISHERY biology is a complex subject area, and people who enter this work must be highly trained. During his training, a student must learn a great deal about the biology of fishes — their structure, food habits, growth rate, reproduction, respiration, water quality requirements, etc. Also, courses in chemistry, physics, statistics, genetics and other areas are needed to prepare him to tackle such complex problems as pollution, fish population dynamics, and fish breeding. Not only must he possess a college degree, but a fishery biologist must have an advanced degree of Master of Sci-

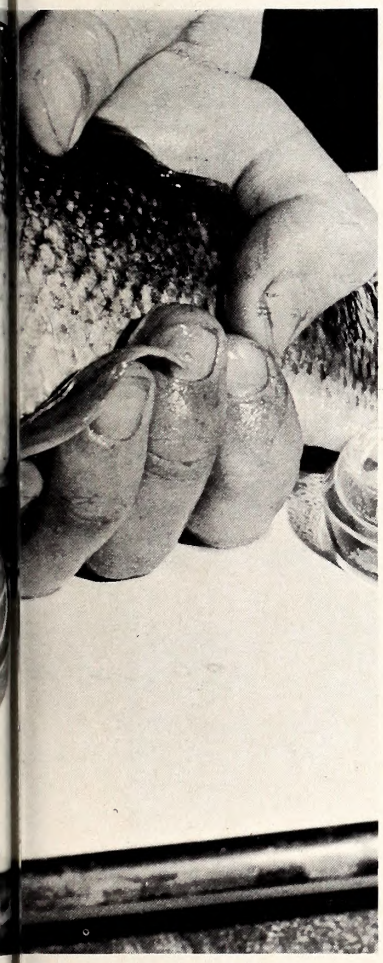
Editor's Note: Unit Leader Dr. F. Eugene Hester is a native North Carolinian. He attended Wake Forest College, N. C. State University, and Auburn University. While an undergraduate student, he was employed during summer months by the U. S. Fish and Wildlife Service and the N. C. Wildlife Resources Commission. He received the Ph.D. degree from Auburn University and for the past six years has been a faculty member at N. C. State University.

Assistant Unit Leader Robert E. Stevens is a graduate of the College of William and Mary and North Carolina State University. Prior to accepting his present position with the Unit, he was a fishery biologist with the North Carolina Wildlife Resources Commission for three years and the South Carolina Wildlife Resources Department for ten years. He has twice received awards for his outstanding work in fishery research and management.

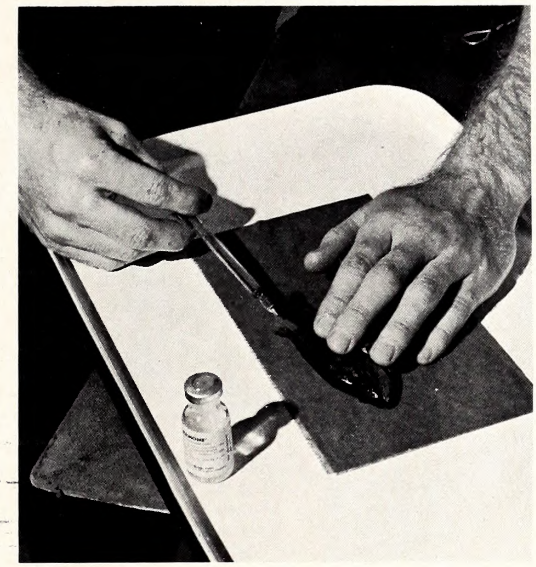
Both the Unit Leader and Assistant Leader are employed by the Bureau of Sport Fisheries and Wildlife and are members of the University faculty.

arolina Cooperative Fishery Unit

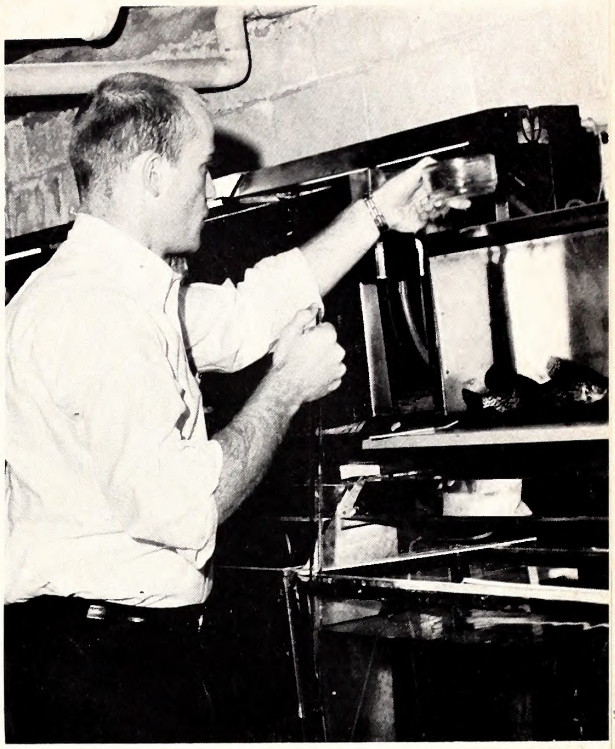
r. F. Eugene Hester
tos by the Author



niques are essential to selec- gs are stripped from a large- he glass container with semen e attempted.



Hormone injections are an important part of the control of reproduction for selective breeding, hybridization and other research experiments.



Graduate student Jerry West feeds two black crappies held for experimentation. Below, longnose gar are examined during population sampling.

ence and in some cases Doctor of Philosophy.

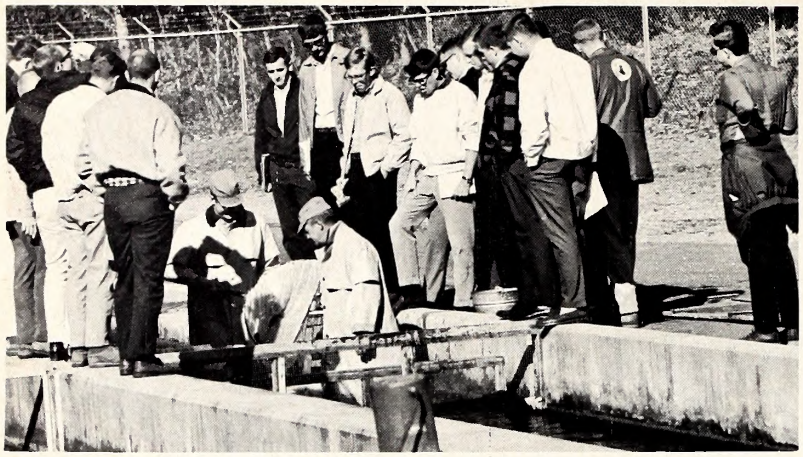
A few years ago it became obvious that we were approaching a severe shortage of these highly trained specialists. The Bureau of Sport Fisheries and Wildlife of the U. S. Department of the Interior recognized the problem and with the help of Congress, offered a solution to the shortage. The Bureau established Cooperative Fishery Units by joint sponsorship with conservational and educational institutions. These units were established primarily for the training of graduate students in fisheries.

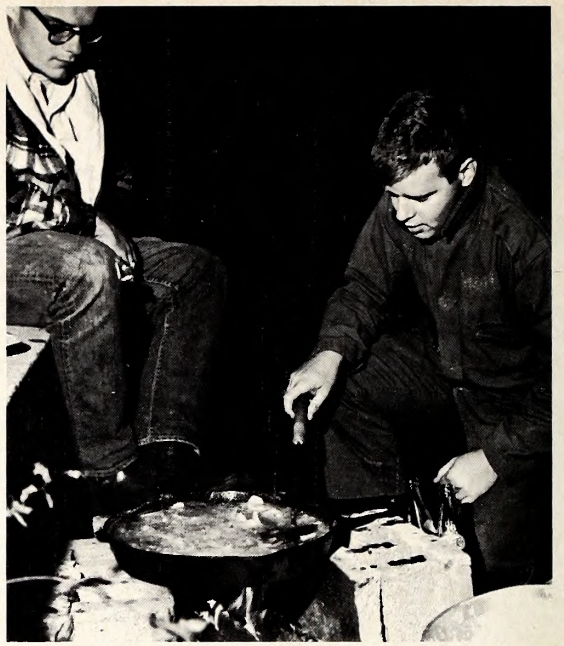
On September 25, 1962, North Carolina State University and the Bureau of Sport Fisheries and Wildlife cooperatively established the North Carolina Cooperative Fishery Unit in the Zoology Department on the N. C. State University campus.

The training of graduate students involves many things in addition to formal course work. It includes seminars, discussions, field trips, report writing, and public speaking; but most of all, every graduate student learns to conduct research so that he can independently carry out investigations of fishery problems when he graduates.

Currently the central theme of our Unit research program is the reproduction, growth and heredity of fishes. There is

Sport Fishery Unit





N. C. State fishery students (left above) visit Walhalla National Fish Hatchery to learn hatchery techniques. A fish cook-out (above) adds some fun amid the work of the Unit activities. Left, graduate student Clair Stalnaker measures bluegills from an inheritance experiment. Growth rate differences are being studied. Below, Garland Pardue examines test fish in aquaria.

much to be gained by a long-term program in selective breeding for rapid growth, good food conversion and other qualities. Also, some hybrids offer promise in fishery management. Several students are conducting studies of selective breeding and hybridization of game fishes. The growth rate and reproductive potential are especially important.

In another important project, a graduate student is measuring the movements of redbreast sunfish. The fish, in a local stream, are trapped, tagged and released. Their subsequent recapture will reveal information about movements upstream or downstream, growth rate, and rate of harvest. Another student is working in coastal streams to determine the effect of a herbicide (sprayed for the control of alligator weed) on fish and fish-food organisms.

Graduate students at the Cooperative Fishery Unit are conducting meaningful research, and the answers they find will provide solutions to fishery problems. Most graduates of the Unit program will become fishery biologists for state and federal agencies, and for private industry; others will become professors of fisheries in various institutions of higher learning and perhaps help establish Cooperative Units elsewhere.

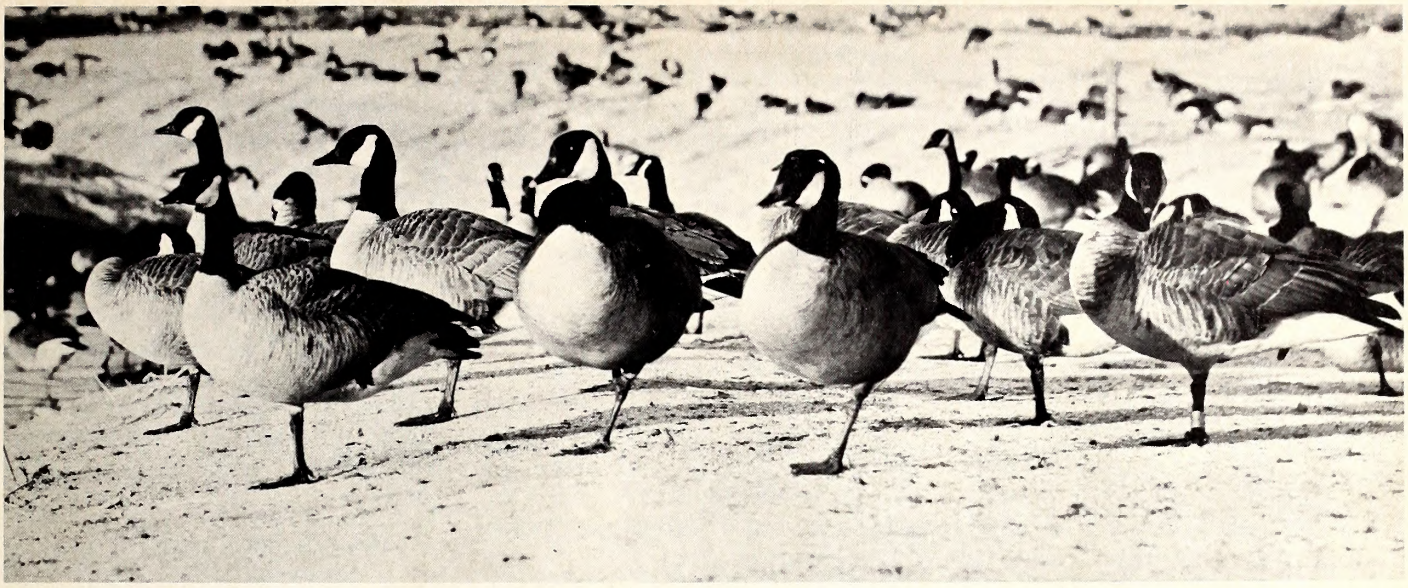


PHOTO BY JACK DERMID

THE HONKER - Game Bird of the Future?

by C. E. Addy
Atlantic Flyway Representative
Bureau of Sport Fisheries and Wildlife

PART 1

IT's no secret to hunters that duck populations in the Atlantic Flyway have been in the doldrums for several years. The outlook for the immediate future looks a shade brighter, and there is hope that on the long road back that we may have as many ducks of the "good eatin' " types as we had back in the mid-fifties. However, the immediate prospect is a continued lower level of hunting opportunity and hunter participation than we had ten years ago.

But, looking at all our cards, is it possible that the Canada goose —the famous honker—can take up some of the slack in waterfowl hunting lost to the ducks? Some folks think so; and with good reason, too.

What is there about the honker that encourages managers to believe that it could provide more hunting recreation than in the past? In the first place, people have found that Canada geese can be rather easily managed compared to many species of game birds. The birds react favorably to situations where plenty of food, water and sanctuary are provided. Geese have different habits from ducks. They will feed exclusively on upland agricultural lands and do not require open water other than as a place to rest, drink and wash. The species has strong homing instincts and can be counted on to utilize specific breeding, migration and wintering areas each year. Geese ordinarily don't stray from established or traditional habitat from year to year as some ducks do. In other words, it appears that if the right conditions were created, new wintering goose flocks could be established in many parts of the Flyway where none now exist.

Another encouraging aspect of goose management concerns the breeding grounds. There is evidence that Canadian habitats could accommodate more birds than now occur there. Furthermore, the principal breeding grounds in Quebec and Labrador are so remote and extensive that man's activities are not likely to have a significant destructive effect, at least in the near future. All this seems to add up to the conclusion that if we manage migration and wintering habitats properly and keep the kill within certain limits we can have many more geese in the Flyway than we have today.

How Many Geese Do We Have?

Over the past 15 years the numbers of honkers wintering in the Atlantic Flyway have fluctuated between a low of about 300,000 to a high of a little over half a million. During the past five years the population has averaged over 450,000.

The bulk of our Atlantic Flyway Canada geese breed in Canada east of James and Hudson Bays and migrate pretty much directly south to their wintering areas. The heaviest concentration of breeding is on the tundra of the Ungava Peninsula in northern Quebec. For the Mattamuskeet birds, this means a trip one way of over 1700 miles. There are, of course, breeding Canadas thinly scattered throughout the forested muskeg country of eastern Canada as well as in the northern states of the Flyway. Some biologists believe there are two forms or races of the big Canada goose in the Flyway. However, most people couldn't tell the two apart in the field.

Groups of birds which migrate and winter along the western edge of the Atlantic Flyway, such as in western Pennsylvania, western North Carolina and the Florida panhandle, are associated with some groups occurring in the eastern part of the Mississippi Flyway. Most of the Canada geese in the Atlantic Flyway, however, are not involved to any significant degree with geese in other flyways.

Over-all distribution in the Flyway is not the most desirable. Most of the Canadian honker population winters in the coastal areas of Delaware, Maryland, Virginia and North Carolina. Throughout the rest of the Flyway there is only a scattering of small groups; the largest number (25,000-30,000 birds) is at the Santee National Wildlife Refuge in South Carolina. Starting from scratch, refuge management at Santee built the flock to its current size in about 15 years.

Who Gets Most of the Shooting?

In recent years, hunters in the states have bagged an average of a little over 100,000 birds a year. Most of the harvest (about 70 percent) takes place in the four states of Delaware, Maryland, Virginia and North Carolina. Only 20 percent of the goose kill occurs in the ten flyway states north of Delaware. Here we have an area through which most of the Flyway's honkers migrate and where nearly 55 percent of the hunters live, but yet they get only about 20 percent of the Canadas bagged in the Flyway. This illustrates the marked variation in kill between one part of the Flyway and another. There are, of course, reasons for this which we will delve into later.

The kill of Flyway geese in Canada isn't precisely known, but it is believed to be 25-30 percent of the total over-all harvest.

Geese Aren't as Productive as Ducks!

Many ducks nest when they are a year old. Canada geese, on the other hand, have to be at least two and usually three years old before they nest. In other words most Canadas don't breed until at least their third summer. This is important because it means that fall flights coming south will usually be dominated by adults and yearlings. Generally, the newly fledged young make up between 30 and 40 percent of the fall flight. In years of poor production considerably less than 30 percent of the flight will be young of the year and it would be a most unusual chain of circumstances which would result in over half of the fall flight being composed of the current season's production.

Very likely 35 percent young in the flight leaving the breeding grounds would represent the average during recent years. This means that if we are at least to hold the level of the population, we have got to keep the Canadian and United States kill plus crippling loss and "natural" losses within this 35 percent figure. If fall flights run about 550,000 on an average, this means that no more than about 190,000 can be lost or killed from all causes if the population is to be maintained. If we want gradually to increase the population then we will have to see to it that less than a loss of 190,000 occurs on an average. To date the legal kill in Canada and the Flyway has not been excessive but it is very likely close to the maximum allowable at current population levels.

Needed—A Canada Goose Management Program!

The Atlantic Waterfowl Council and its Technical Section is composed of administrators and technicians from each of the states in the Flyway and the six eastern provinces of Canada. The organization was formed several years ago for the purpose of preserving waterfowl resources through collective planning and coordination of research and management programs. One of the working committees of the Technical Section has to do with Canada goose management. This committee has drawn up a proposed management program which has the following objectives:

An increased Flyway population.

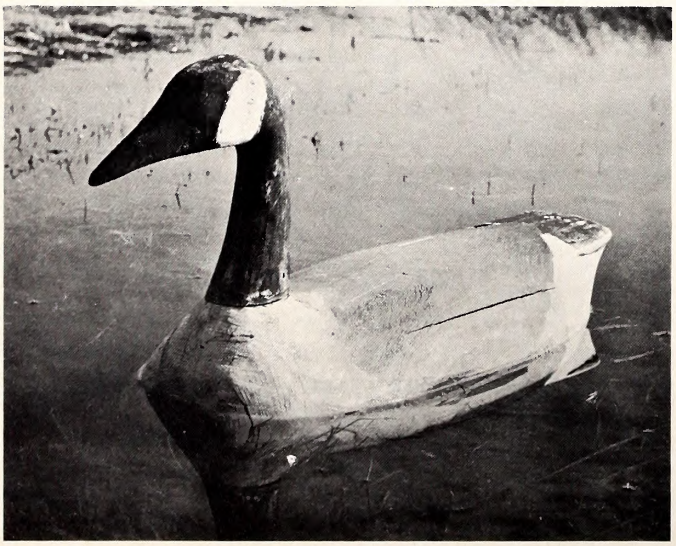
Maximum fall/winter distribution.

Improvement of the recrea-

PHOTO BY JACK DERMID

Goose hunting is a sport, and this old decoy could tell us many an interesting tale about past seasons. What has the end of this hunter's day revealed?

PHOTO BY JOHN R. PARKER, JR.



tional quality of the sport.

More equitable distribution of kill and hunting opportunity.

Reduction in the waste of birds.

These are worthy goals but let's take a look at what needs to be done to attain them.

We mentioned previously that it is believed that the breeding grounds could support more birds. If this is so, then all we need to do to build the Flyway wintering population to three quarters of a million or perhaps a million birds would be to provide enough suitable wintering habitat and send more birds back to the breeding grounds each year. In time we would reach our goal but of course we could expect some set backs since top breeding conditions aren't going to occur every year.

At present the honker congregates in large numbers at relatively few locations in the Flyway. The reason for this is that ample agricultural foods together with adequate nearby sanctuaries make these particular areas very attractive to geese. With the advent of the mechanical corn picker on the eastern shore of Maryland the goose population started to build. Nowadays, providing for goose populations and hunting on the eastern shore is an important consideration in the agricultural program of the area.

In a smaller way the eastern shore situation could be duplicated at many other locations in the Flyway if the local people wanted to and funds were available with which to get started. Particularly worthy of consideration is the upper Coastal Plain and the Piedmont from Virginia south to northern Florida. In these regions there would be many locations where habitat and sanctuary could readily support goose flocks of several thousand birds each. In some situations where agricultural fields are already available, the principal need at the start would be merely the setting up of an inviolate sanctuary with some decoy birds and perhaps closing the season locally until the flock becomes well established. At any rate, a major item in the future management program for the Canada goose will be to encourage the establishment of many new wintering goose flocks in the southern part of the Flyway.

Starting new wintering flocks and developing additonal harvest areas in the north will contribute materially to wide distributon of the birds and better distribution of hunting opportunity. To do this, however, some major problems have to be solved.

Too Many Geese?— At Some Locations, Perhaps

One of these problems is the need to prevent excessive concentrations of birds on limited local areas, particularly in the northern part of the Flyway.

Although a problem in this regard may be developing in Delaware, the Atlantic Flyway as a whole has been relatively free of problems associated with unnatural build-ups on restricted areas. To be sure, the bulk of the Flyway's goose population winters in the coastal area of Delaware, Maryland, Virginia and North Carolina. And within this coastal zone there are undoubtedly some limited areas where unnecessarily large numbers of birds occur. But, when one looks at this whole coastal area as an over-all wintering unit, one realizes that the habitats are quite extensive, the birds are widely dispersed and are available to hunters over much of the area. On migration areas, however, the situation could be different. As more management areas are established in the northern part of the Flyway and Canada we must be careful that large numbers of birds (25,000 or more) aren't held on these areas for extended periods into the fall and early winter. The holding of birds in this manner might cause serious depredations on nearby crops, encourage poor quality "firing line" type shooting along the boundaries of the area and prevent many hunters, particularly those to the south, from obtaining their fair share of the birds.

Next Month: Part 2.
Getting More Geese to Us.

PHOTO BY JACK DERMID

Crowded Waters

Fishing You-name-it Swimming Boating RACING Canoeing CRUISING Water Skiing TROLLING Sailing

BOATING accidents continue to occur needlessly. Most are attributed to carelessness, but our present lack of precise "rules of the road" may be contributing to many careless acts that could otherwise be avoided.

Collisions between boats occur all too often and up goes the cry for "speed laws", laws against young operators or other questionable regulation. The answer seems simple to me and I've seen it work with success in some states on individual lakes.

A good way to avoid collisions is to separate the objects that would normally be involved, or let them travel in the same direction as much as possible. When leaving the shore, all boats should take off to the right at approximately a 45° angle until well out on the water.

All boats (under crowded conditions especially) should use a counter-clockwise system of dropping off skiers and restrict their travel in the other direction to maneuvering out in the middle of large bodies of water.

Swimming should be restricted from certain areas that serve as busy drop-off points for skiers or travel channels for boats. Swimming areas, especially for children, should be roped off and all boats required to stay away from the location. It's impossible to cut a swimmer with a prop when boats and swimmers are kept separated.

Likewise, there are certain portions of lakes or streams that should be off limits to skiers; shallow water areas for example. These should be marked off and avoided by skiers.

Water activities need not and in many cases should not compete with one another. Some places serve better as fishing areas, some serve better as skiing areas and swimmers should be kept safely to themselves. This does not mean that all three activities cannot occur simultaneously on the same lake. To the contrary, it allows multiple use with a much enlarged degree of safety. Even speed boating or racing can be enjoyed as long as the participants follow good common sense rules and stay away from slower boats which are engaged in different sports.

Here is the frightening situation that exists today on many bodies of water in North Carolina: cabin cruisers, sailboats, canoes, speedboats, ski-rigs, and fishing craft all enter the water on weekends. These are piloted by young people, experienced operators, a few drunks, white-collar workers, and "hot rudders" —and all are allowed to travel in any direction, to participate in many varied forms of recreation and merriment. Hundreds of boats and people going everywhere and doing everything, all at the same time and, in too many cases very near the same location.

However, numbers alone are not necessarily dangerous. Many ski clubs and organized groups always stay together for added fun afloat. Though several boats operate off the same beach at the same time, when counter-clockwise traffic patterns are observed, there is relatively little danger, and very few, if any, accidents are recorded from such activities.

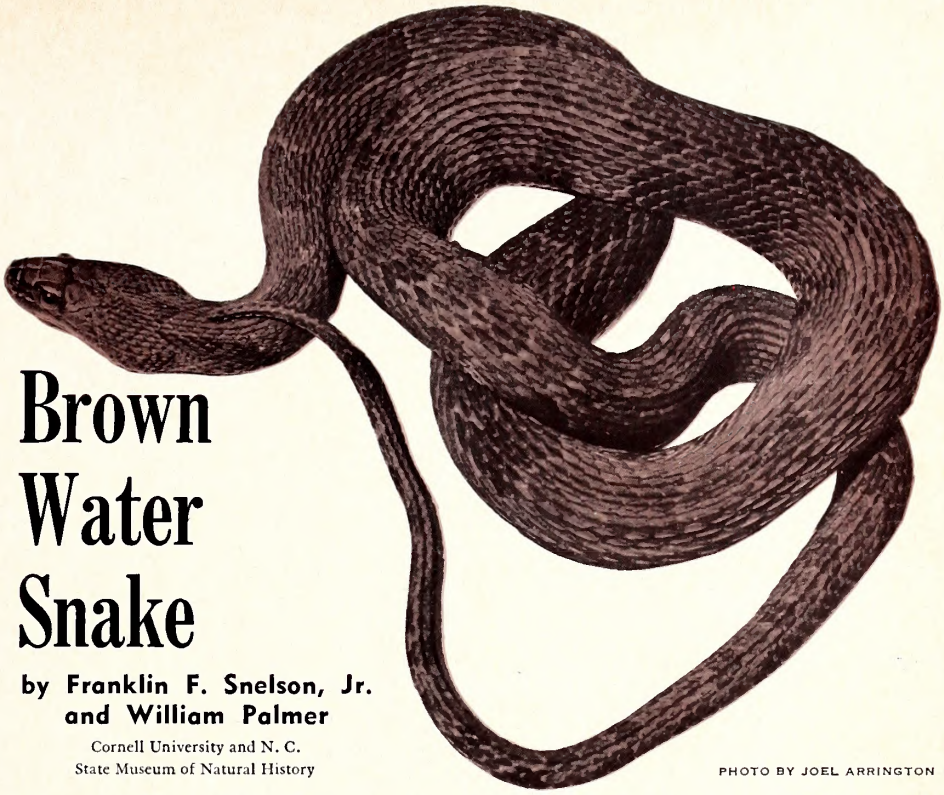
Let's face it: we, the boaters, must take it upon ourselves to commence practicing good "rules of the road" or face stiffer laws as a consequence. Wildlife Protectors and Coast Guardsmen are usually around to check our safety equipment, and the rescue squads stand ready to drag us off the bottom after we've drowned; but what are we boaters doing for ourselves, except visiting Davy Jones at an ever increasing rate? It's time we faced up to our responsibilites as lovers of water sports.

Following is a code of voluntary water rules that I feel would start us in the right direction:

- Separate activities so that swimmers, skiers, fishermen and others may have their fun without interfering with one another.
- Follow counter-clockwise traffic patterns when dropping off skiers, and always turn to the right at a 45° angle when heading out from shore on a boat.
- Avoid using crowded waters on weekends when the lake usage is high. Many of our lakes are practically unused during the week and overcrowded on weekends.
- Have all the necessary safety equipment handy and *use it.*
- Report to the Wildlife Resources Commission, United States Coast Guard or other responsible agency any situation on any body of water that you consider hazardous.
- Show courtesy and consideration to others and always be ready to lend assistance.

We can accomplish most of the mentioned improvements in our various water sports without hurting our enjoyment in the least. If we water users do not take the initiative and voluntarily change our ways, then more controls and laws are bound to be put into force for our own good.

by George E. Burdick



Brown Water Snake

by Franklin F. Snelson, Jr. and William Palmer

Cornell University and N. C. State Museum of Natural History

PHOTO BY JOEL ARRINGTON

IT is doubtful if any species of harmless snake in North Carolina is more often confused with the dangerous cottonmouth than is the brown water snake, *Natrix taxispilota*. The heavy body, large flattened head, and typical bad temper combine to make this species appear to the uninformed as deadly as any of the truly venomous species. Most of the common names employed for the reptile in the State imply a harmful nature: water moccasin, water rattler, and pileated moccasin. Moreover, even experienced persons frequently have difficulty immediately identifying this species as distinct from its dangerous aquatic counterpart.

As is the case with all of our harmless species, the brown water snake possesses no pit between the eye and the nostril; the pupil of the eye is round instead of elliptical; and the scales on the underside of the tail are divided and not in a single row. The background color is brown with a series of fairly distinct dark, square - shaped blotches down the middle of the back; a similar alternating series is present along each side. However, when a specimen has been out of water for a time and has become dry, the characteristic markings may appear inconspicuous (See photograph above); in fact, they may be all but obliterated. Under these conditions a quick identification may prove especially difficult. The underside is yellowish, heavily mottled with dark brown or black markings.

This big serpent is the largest of the water snakes attaining a maximum length in excess of five feet. The average length is about three feet and the largest specimen examined from the State measured 57 inches.

The brown water snake ranges from southeastern Virginia south in the coastal plain throughout Florida and westward into southern Alabama. It is found in suitable aquatic habitats throughout eastern North Carolina.

A very abundant species along lakes and sluggish waterways of the Coastal Plain, this serpent is the most arboreal North Carolina member of the genus, often climbing in trees and bushes as high as 15 or more feet off the water. During the warmer days of early spring brown water snakes may often be observed in large numbers basking on limbs and in shrubs along all of the coastal rivers and their tributaries. Most specimens are extremely wary and drop into the water at the slightest disturbance.

Their marked tendency to climb, sometimes to rather respectable heights, has brought about particular collecting techniques. The use of a noosed pole, so often considered the proper tool for capturing snakes, is largely an ineffective instrument for collecting water snakes (and most other species as well) unless the creature happens to conveniently have its head situated so that it is free from obstructing limbs and foliage. More often than not the head of the desired specimen is resting on a coil of the body or is lying flat against a branch in such a manner that it is impossible to slip a noose around the head and neck without first frightening the snake from its resting place to be lost irretrievably beneath the water. A method which has proved most successful requires the work of two men in a boat, one of whom, maneuvering from the stern, quietly paddles to within reach of the specimen which is then quickly seized by the man previously stationed in the bow. When snakes are located at heights above a person's reach, collectors have successfully used a cane fishing pole or similar object. The boat is paddled beneath the snake and the pole is employed to prod the animal which usually responds by dropping into the bottom of the boat where it can be caught by hand. It is wise to wear gloves when indescriminately catching water snakes by hand for these creatures can and normally do bite viciously when first captured. *Needless to say that the identity of the serpent be definitely ascertained before grabbing it with or without protective gloves!*

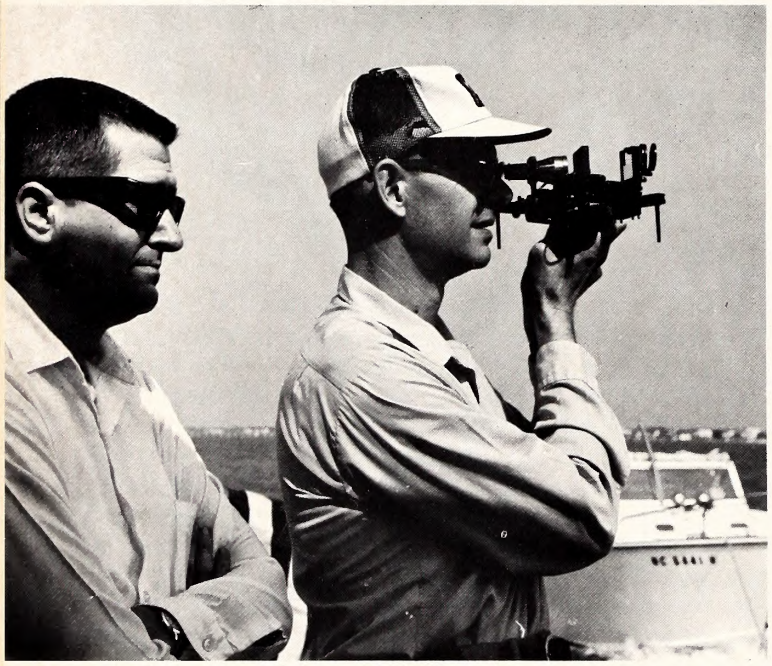
The habit of extruding malodorous musk when first caught is common with most snakes and it appears to be especially well developed in the water snakes whose copious secretions are certainly among the most pungent of all. Despite its unpleasant odor this musk is no more harmful than water.

Like all of the large water snakes this species is very prolific and a single female may give birth to 50 or more young. Mating occurs in the spring and the

• **continued on page 27**

The Skipper

Conducted by John Parker



Dr. T. S. Withers, of the Kinston Power Squadron, takes a sighting on a Morehead City landmark as the survey cruise gets underway. Bill Spivey and other crew members keep a look out for important landmarks, shoal waters, etc. Below, fishermen head for Cape Lookout. The Will-O-Wisp (right) will soon begin another day of surveying.

THERE is a special type of anticipation among those that are about to embark on a cruise. The smell of salt marsh, the creaking of line against piling as a morning breeze gently swings the boat, the cry of the gulls, and the rumble of engine exhausts are a few of the things that create this unusual, exciting atmosphere.

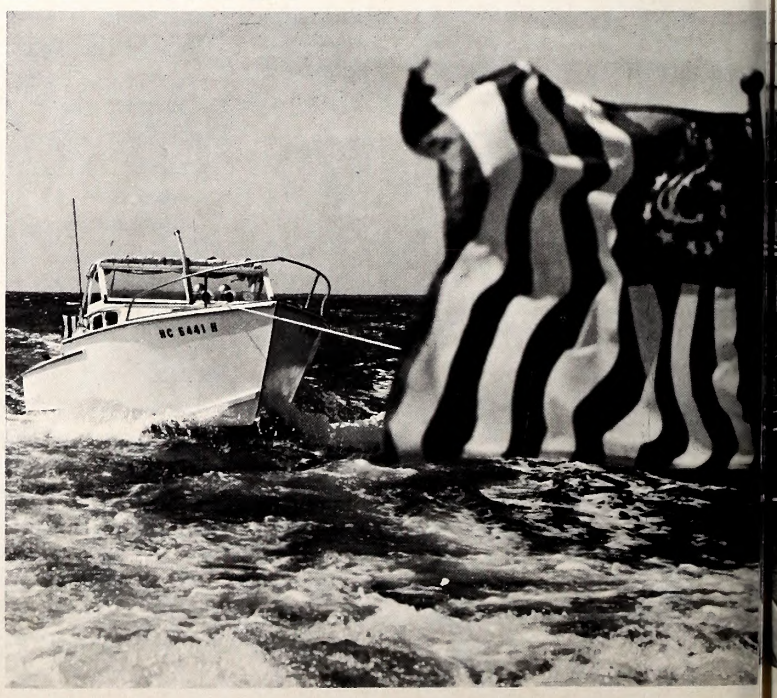
And so it was on a weekend in April as another U. S. Power Squadron survey of aids to navigation, waterways hazards, etc., was about to get underway. The findings of this survey and others like it will be forwarded to Coast and Geodetic Survey authorities. (See "U. S. Power Squadrons Survey—The Sign Post Of The Sea," *Wildlife in North Carolina,* December, 1965).

On this particular survey, the Kinston Squadron commanded by W. T. Casey was to survey the Pamlico River area, Bogue and Core Sounds. The port of embarkation was Morehead City.

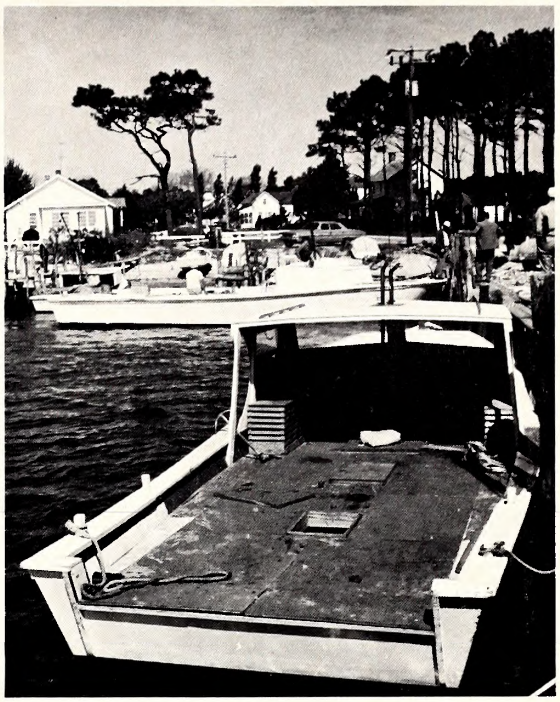
After a brief early morning meet, the skippers took up headings for their respective survey areas. Commander Casey headed his boat, the Will-O'-Wisp, toward Harkers Island. Plans called for a stop at the island, at Davis on Core Sound and finally through the Cedar Island thorofare, up the Neuse and through Adams Creek back to Morehead.

A weekend of service to the boating public, and a few of the pleasures of boating are revealed in the following photo feature.

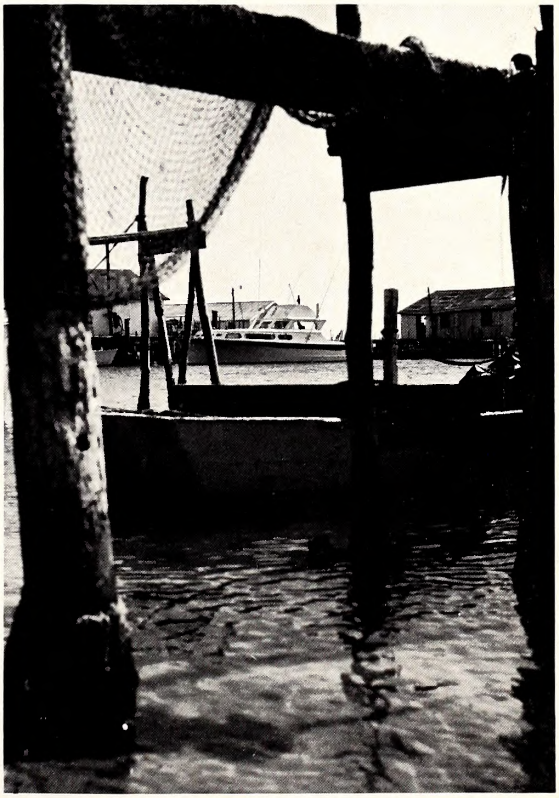
Two more wide-beamed outboard cruisers leave the harbor, setting a course for the distant Cape Lookout light. Everyone stays alert. This handsome outboard (below) built by Cdr. Casey's brother, Gene, isn't crippled; she rides the wake of the Will-O-Wisp easily, thus conserving fuel for her job of surveying the more shallow bays.



Think of the countless waves that have battered the bow of this old fishing boat—the miles of sound she has traversed. It's difficult to think of her as simply "a thing." Imagine the stories she could spin if she could but relate her adventures afloat. Cruises of the type pictured here combine service with pleasure.



This isn't a floating skating rink, but rather a beach buggy ferry. These unusual craft provide access to the excellent fishing of Core Banks.



Cdr. Casey built the Will-O-Wisp, framed here by piling and fish net, from a Harkers Island hull. Craft such as this have a genuine personality. Left, a battery of crab holding pens bob in shallow water. Crabbing is an important industry here.

Photo Feature by John R. Parker, Jr.

NORTH CAROLINA WILDLIFE

RESOURCE-O-GRAM

A ROUNDUP OF THE LATEST WILDLIFE NEWS

National Safe Boating Week

North Carolina will observe National Safe Boating Week July 3-9. Governor Dan Moore has designated this week within the state and urged all boaters to operate their craft safely not only during this week but throughout the year. At the end of this year's vacation-boating season, the Governor's Committee on Water Safety is expected to come up with concrete recommendations for legislation and other means of reducing accidents pertaining to water use. Meanwhile the Wildlife Resources Commission's three patrol planes will be giving special emphasis to patrolling the more heavily used waters of the state throughout the summer. Infractions of the boating safety law are easily spotted from the air and reported to patrol boats on the water.

Hunting Regulations Being Published

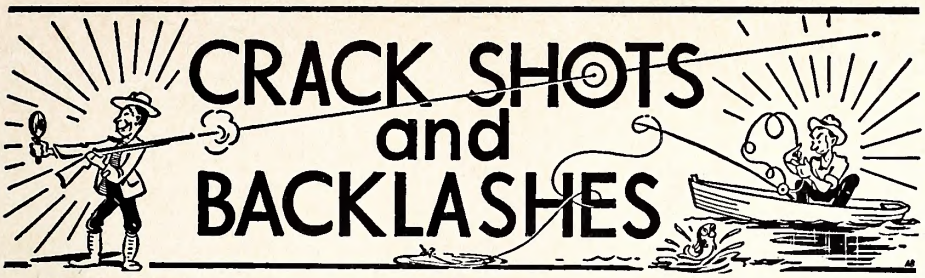
The Wildlife Resources Commission is in the process of publishing over 400,000 copies of the 1966-1967 non-migratory game and trapping regulations for issue to license-buying hunters. The rule books will be distributed to license dealers throughout the state, and will be ready for issue by August 1, when hunting licenses and combination hunting-fishing licenses go on sale.

Migratory Game Bird Regulations

The Wildlife Resources Commission will again be given a framework of dates and bag limits from which to select regulations on migratory game birds. These will be announced by the U. S. Fish and Wildlife Service at a later date. First word will be on doves, snipe, woodcock, and marsh hens, with waterfowl regulations to be announced later. At press time it was doubtful that there would be any important relaxations in the waterfowl seasons and bag limits in the forthcoming season.

Boating Accidents Down

As of mid-June the boating accident rate was behind that of last year. With most of the boating season still ahead and an increased number of boats on the water, the rate can be expected to increase as time goes on.



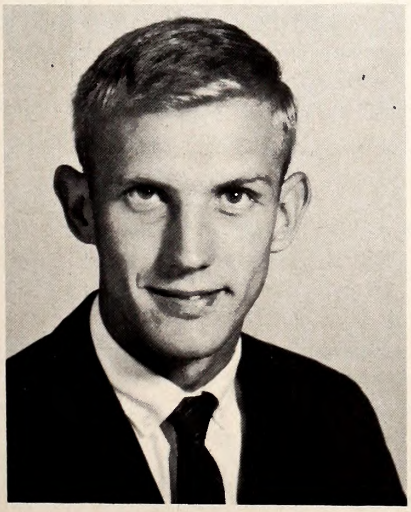
DEPARTMENT OF LETTERS TO THE EDITORS, FIELD NOTES, AND ITEMS OF INTEREST

Conducted By Rod Amundson

Lloyd H. Saunders of Carolina Beach, a Senior Honor student at Wilmington College, is the recipient of an undergraduate Research Grant by the North Carolina Academy of Science.

Mr. Saunders' research will be conducted through the Department of Biology and will be concerned with a "Survey of the Small Mammals of Smith Island."

Smith Island, at the southeastern extremity of the Cape Fear Peninsula, marks the limits of distribution of both northern and southern forms of animal life and is thus of much interest to biologists. (See *Wildlife,* Jan. 1966—Ed) The island has been isolated from the mainland for over 250 years, and some of the animals there may be developing independently and may now differ slightly from those on the mainland. The island is relatively undisturbed at present, but with the expansion of commercial enterprise, it may soon face drastic changes. All of these factors make Smith Island of particular current interest and importance for biological research. Mr. Saunders' study is the first systematic attempt to survey the small mammals of this island. His work should lead to a better understanding of the fauna of this interesting and important natural area.



Saunders

A Matter For Consideration

DEAR SIRS: In the February issue of WILDLIFE IN NORTH CAROLINA you printed an inquiry from J. R. Hall regarding the legality of rifles for hunting in the various counties of the State. I would like to point out several apparent and probably actual inadequacies in the regulations enforced in several counties.

The most outstanding is the situation in Richmond and Scotland Counties: "It is unlawful to hunt deer with a rifle **larger** than .22 calibre." This statute is, to euphemize, nonsensical. I do not dispute the fact that deer have been killed with .22 rifles, and that deer can be killed with .22's. I do dispute the contention that it is sporting to hunt game of this size with a rifle this small. If I may take the report in your magazine verbatim, this statute specifies **calibre** (.22) only, and therefore does not exclude the potent .220 Swift (a .30-06 casing necked down to .22), the .22 Hornet, the .218 Bee, and the .219 Zipper. If the purpose of the two counties mentioned above is to make the sport safer they are doing so, but only for the quarry-deer. Any of the cartridges just enumerated are fully capable of carrying at **least** twice the distance of a standard velocity .22 Long Rifle, though they are more liable to exploding on impact with a tree limb due to their high velocity. My recommendation is if these counties are heavily populated and the carrying power of a rifle load of sufficient power is deemed unsafe, that deer hunting should be permissable only with shotgun.

In Hoke county this is apparently the solution county authorities have come up with.

The second of the inadequacies is in the regulations of the Wildlife Resources Commission regarding the use of firearms in the Commission's Management Areas. It is stated in your reply on page 29 that in most of these areas large game may be hunted with rifles of .243 calibre or larger, and that only .22 calibre rimfire may be employed in the pursuit of small game. I realize that the regulations as quoted are somewhat abridged. However is the commission aware that they recognize as legal such old slingshots as the .25-20, the .32-20, the .32 WRF, the .44-40, and the .30-40 Krag? The .30-40 Krag **is** adequate, but is the only one in the list capable of killing a deer at much over 80 yards or so in any kind of cover. There are limits, of course, to the use of the rifles; expense and common sense. No one is going after bear or boar with a .25-20 (I hope!), and the .32-20 is good for turkey only and more expensive to shoot than factory loaded .30-06 with non-corrosive primer.

Over the years firearms manufacturers have heaped a vast array of rifles and cartridges upon the sporting public. It has been and will continue to be difficult for those whose job it is to research and recommend firearms regulations for hunting. It seems to be that it is of prime concern, in the interests of hunting safety, sportsmanship, and even in sense of being humane, that there be some codification and systematic review made of the hunting firearms regulations of the State of North Carolina.

In areas where it is feasible, large game should be hunted with a rifle of suitable calibre. If this necessitates the specification of certain rifles and calibres as non-permissable, so be it. This would seem to be the only alternative to specfying a certain minimum of ballistic performance which leads us into all kinds of problems. The simplest approach seems to me to be the mutation or deletion of the anachronistic statutes now in effect.

I am not fond of hunting deer with a shotgun, but if in our State there are areas where it is not safe to hunt deer with a suitable rifle, the shotgun **slug** no smaller that 16 Gauge should be the rule dictated by both common sense and sportsmanship.

As I close, I am reminded of a deer, killed with a rifle, that I helped a friend of mine dress once. It was a nice buck in size, but a walking testimonial to the crux of this letter. We found that my friend had very probably in the act of sighting and squeezing the trigger performed a mercy killing of the animal. We found that the animal had been

KNOW YOUR PROTECTOR

Marvin E. Plummer

Wildlife Protector Marvin E. Plummer, stationed at Laurinburg, North Carolina, was born in Rowan County, October 23, 1938. His parents are Mr. & Mrs. A. M. Plummer of Salisbury, North Carolina. He is a graduate of Boyden High School, Salisbury, North Carolina, and prior to his employment with the N. C. Wildlife Resources Commission, he served over four years in the U. S. Air Force.

After completing Pre-Service Training School for Wildlife Protectors at the Institute of Government in Chapel Hill, North Carolina, in 1962, he was employed as Wildlife Protector Trainee in Henderson County from February, 1963 to November, 1963. Then he was transferred to Scotland County as Protector. Since being employed, Marvin has attended five In-Service Training Schools and is an instructor of the Defensive Tactic School.

Protector Plummer is a member of N. C. Air National Guard and serves on the Guard Pistol Team. He is a member of the Laurinburg Jaycees and has served as a Director for one year; member of the National Rifle Association, and a Hunter Safety Instructor. He is married to the former Eleanor Fay Davis of Winston-Salem, North Carolina. The Plummers are members of the Lutheran Church of the Living Word in Laurinburg where Marvin is a councilman.

DIVISION ENFORCEMENT RECORD FOR APRIL, 1966

HUNTING & FISHING	
Persons checked	51,353
Total prosecutions	983
Total convictions	967
Total cases not guilty	8
Total cases nol prossed	8
Total fines collected	$3,601.95
Total costs collected	$8,327.95
BOATING	
Persons checked	6,379
Total prosecutions	228
Total convictions	224
Total cases not guilty	1
Total cases nol prossed	3
Total fines collected	$ 466.85
Total costs collected	$2,236.00

All fines and any arrest or witness fees are paid into the school funds of the counties in which the violations occurred, *and no part of the fines or costs collected are paid to the North Carolina Wildlife Resources Commission or its personnel.*

---

fired at and hit no less than three times with a .22 rifle, and one of the intact bullets was a .22 short. Two of the slugs were found in masses of subcutaneous scar in the underlying connective tissue: one was roughly four inches in diameter and the other was about five and one half inches across. Both showed evidence of severe but relatively superficial damage; to the muscle layers of the stomach region (not the organ itself), and to the right intra-costal muscles (between the ribs). The last, the .22 short slug, had entered barely above the left eye, punctured the skin, and, trapped between the tight hide of the head and the skull, had slewed around at least once and come to rest below the left ear. The left ear appeared to have undergone several recurrent infections, was quite unpleasant to the senses, and was apparently useless.

Though this did not occur in this State and the animal was a little larger than the deer commonly found in North Carolina (Mule Deer), I have learned a lasting lesson.

Even though it is commonplace for deer to be dressed out and for lodged buckshot to be found, I shudder to think that people can legally pot away at deer or other larger game with a .22 rifle or an antiquated varmit buster that should be in the scrap iron pile or over the mantlepiece. JOHN E. GILMORE, GREENSBORO.

Between the *Wildlife* Bookends

Getting Out of Outdoor Trouble

The title of this nearly pocket-size handbook on outdoor safety almost eliminates the need for further comment. *Getting Out Of Outdoor Trouble* by W. K. Menie (a former U. S. Ranger) has on each of its 96 pages one or more life saving tips. There is little if any extraneous information. The author gets right to the point on each of the many items covered. The book is interesting enough to read but has been developed to make it quite useful as a ready reference guide also.

Perhaps what makes this safety handbook unique is its diversification. Starting with tips on loading the car, the reader is canoed safely along by safe driving tips, especially in rough weather, into camping, boat safety and further into wilderness survival.

Easterners may not be overly interested in the treatment of desert survival. However, the chapters on first aid, unusual emergencies and what to do if lost will be of interest to anyone interested in accident prevention

in the out of doors.

Getting Out of Trouble is published by the Stackpole Books, Harrisburg, Pennsylvania. Price $2.95. **John R. Parker, Jr.**

"North Carolina, Its Geology and Mineral Resources" by Dr. J. L. Stuckey, Div. of Mineral Resources, Raleigh.

Many people who are interested in outdoor pursuits are interested in the earth which is the base on which all life and scenery has developed. The geologist or "rock hound" is interested in below-surface rocks and minerals.

This generation is fortunate that they could have this author of 45 years experience take the opportunity to put together, in one 570 page book, this comprehensive story. The author had the rare ability to so write that the layman, as well as the trained geologist, will find the text clear and informative. Our complex geology is systematized for the first time insofar as this is possible.

The mining story begins with that of prehistoric American Indians, followed by de Soto's search for gold, and fittingly ends with the development of phosphate deposits in Beaufort County.

The Table of Contents is easy to follow; the Bibliography is one that will challenge any student; and the Index points to a multiplicity of information that any reader will appreciate.

Harry T. Davis

• **continued from page 21**

young are about 10-12 inches in length when born during the late summer or early fall.

The food of the brown water snake apparently consists almost entirely of fishes and usually of the non-game varieties such as suckers and catfish. Some game species doubtless are included in their diet. In recent years, however, the major role of the predator in nature has become better understood and the presence of these creatures actually provides better fishing and hunting for more sportsmen. In the vicinity of fish hatcheries water snakes can become a nuisance and their presence in such areas should be discouraged, although it probably is best to leave them unmolested in natural habitats.

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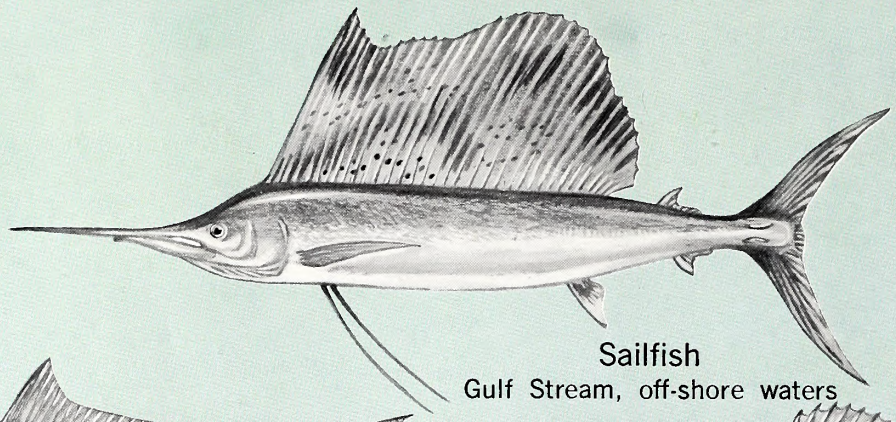
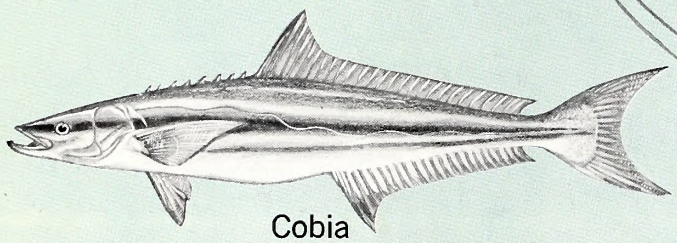
North Carolina

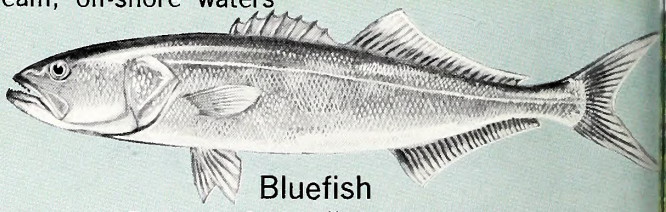
Coastal Game Fish



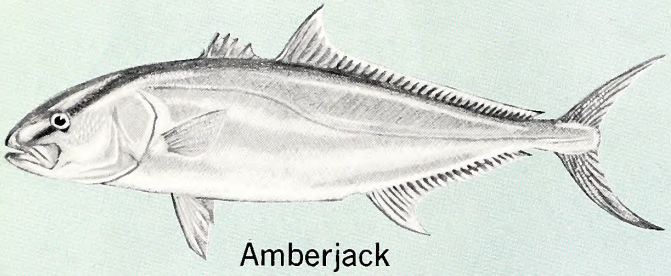
Sailfish
Gulf Stream, off-shore waters



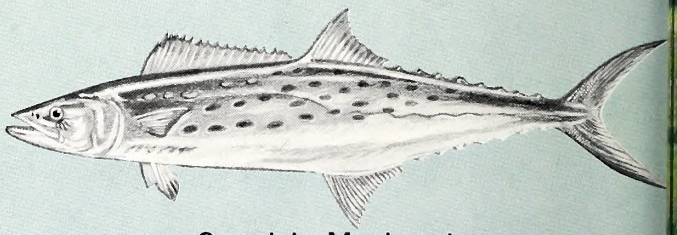
Cobia
Mostly in large sounds



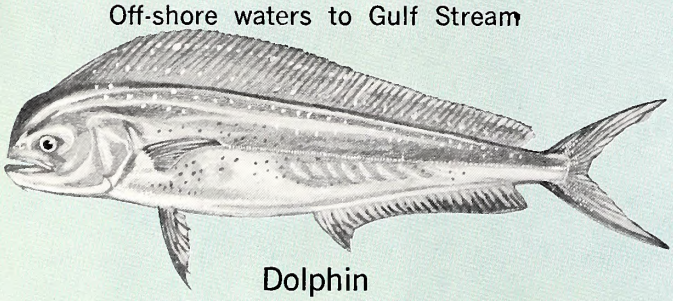
Bluefish
From surf to off-shore waters



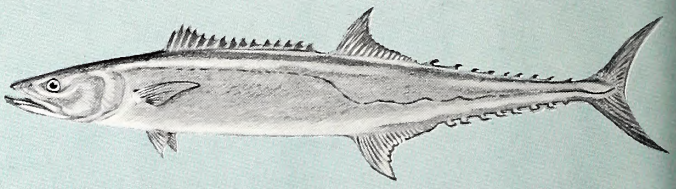
Amberjack
Off-shore waters to Gulf Stream



Spanish Mackerel
May be close to shore



Dolphin
Off-shore to Gulf Stream



King Mackerel
Off-shore waters

From the foamy surf to the Gulf Stream's blue waters, these gamesters are waiting for you. Some of the best fishing in the off-shore waters is in midsummer. Try them on light tackle for some real fine sport.

ILLUSTRATIONS COURTESY THE GRAPHIC PRESS, INC.

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Wildlife IN NORTH CAROLINA

AUGUST, 1966

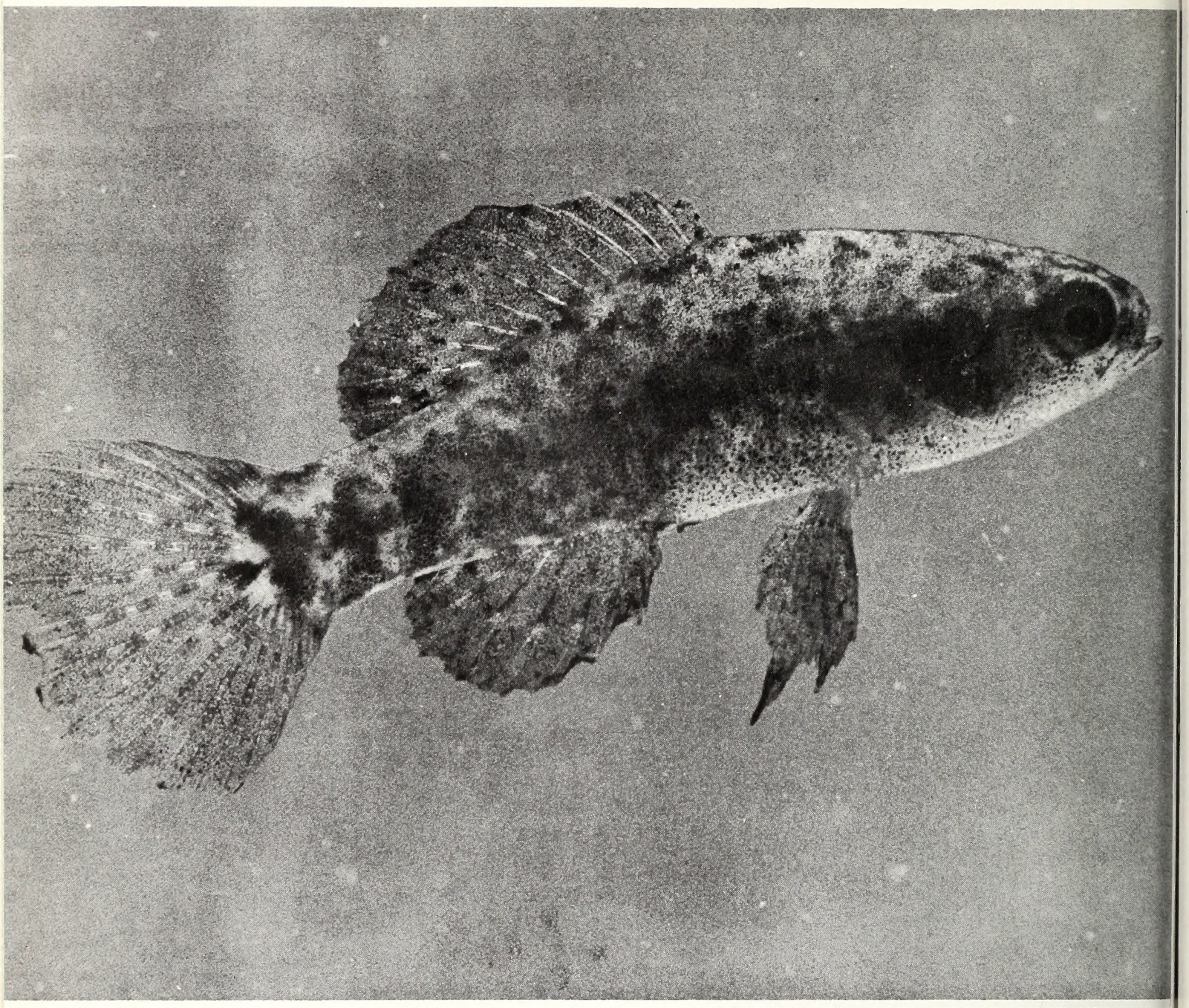

PHOTO BY JOEL ARRINGTON

How big? Well, this is an Everglades pygmy sunfish, one of the smallest known fishes, and a big one might scale an inch long. The beautiful little fish is limited to the southeastern counties and its range extends on into Florida. It serves primarily as forage for pickerel and other game fish.

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WILDLIFE IN NORTH CAROLINA recognizes the need for close cooperation between State and Federal conservation agencies and the people who hunt and fish—to bring about a restoration of our renewable resources. The Editor gratefully receives for publication news items, articles, and photographs dealing with the North Carolina out-of-doors, but reserves the right to reject materials submitted. Full credit is given for all materials published.

* * *

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AUGUST, 1966 VOL. XXX, NO. 8

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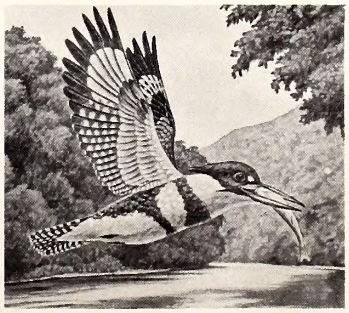
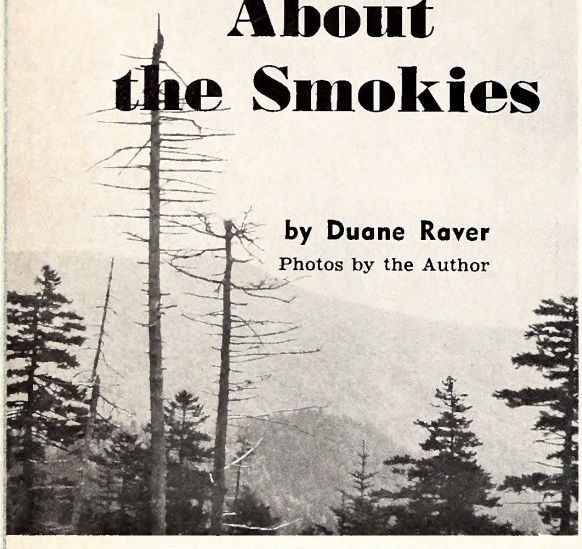


If you're a fisherman (and even if you're not) you've very likely encountered a belted kingfisher sometime during an outing near a lake or stream. He himself is an ardent fisherman, and very often will outfish you! Even with his ability to most always come up with a fish dinner, the kingfisher does little harm to our fish populations. See the related story on page 22. Painting by Kent Pendleton.

Something About the Smokies

by Duane Raver

Photos by the Author



SCENE FROM CLINGMAN'S DOME

PARK ENTRANCE

WHENEVER you get almost 6,000,000 folks visiting the same spot within a year's time, there must be something about the locality that's a bit unique. And this is what has happened now for four consecutive seasons in the Great Smoky Mountains National Park. The 1965 attendance to this mountain playground was 5,954,900. There must be something about the Smokies.

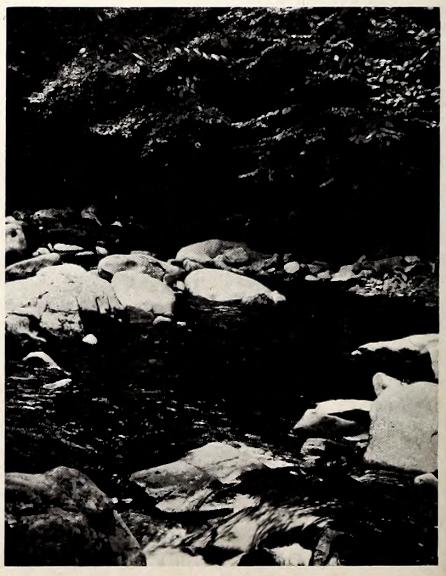
Certainly one thing that impresses the visitor is the Park's size: 800 square miles of majestic peaks and valleys. And only a small fraction is visible from the well-kept roads that wind about the forested slopes. The vastness of this area has been impressing naturalists for decades. A century ago, naturalist-geographer Arnold Guyot explored this region and said: "By their number, their magnitude, the continuity and general elevation of the chains, and of the base upon which they repose, they are like a massive and high citadel which is really the culminating region of all the Appalachian System."

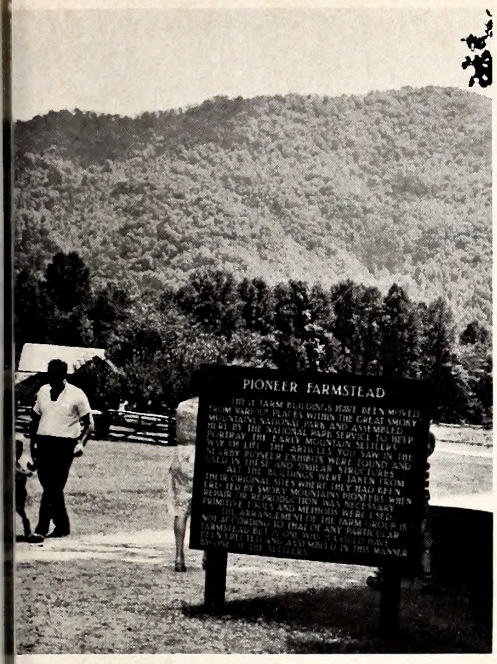
Yet with streams of vehicles from virtually every state in the Union filing through the Park, it maintains much of its wilderness qualities. The more accessible areas are often filled to capacity, but for the adventurers, there are more than 650 miles of horse and foot trails criss-crossing dense forests of age-old timber, winding along sparkling trout streams, and brushing by picturesque waterfalls. The National Park Service, which administers the Park, continuously strives to maintain its naturalness and beauty. Development is done with extreme care and in keeping with the natural surroundings. But only with the continued cooperation of its many visitors can the Service keep the Park beautiful for future Americans to enjoy.

Although a swing through the Park by auto will furnish many moments of scenic splendor, a stay of several days is minimum for even hitting the high spots of the area. Perhaps the best starting place will be the Visitor Center in the headquarters area. You may want to study some of the literature about the Park and surrounding area before you actually make the trip. The Superintendent of Documents, U. S. Government Printing Office, Washington, D. C., 20402, furnishes a comprehensive booklet, "Great Smoky National Park," for 15 cents. You will also be supplied with information at the Visitor Center.

The Park has something for just about everyone who enjoys being out-of-doors. There isn't a

It's a rare trip through the Smokies on which you don't encounter a bear. Keep your distance, though. Cool, clean streams like the one below, are many.





A group of old farm buildings has been arranged for your trip to pioneer times.

season that doesn't have some special qualities. Spring, with its rather unpredictable beginning, sends the early forest flowers and the blush of light green to the hardwoods. Summer and her warm days and usually cool nights combines the last of the mountain laurel and flame azalea with rhododendrons. The deep greens of late summer blend with the dazzling autumn color display. The showers of summer are replaced with clear, invigorating days and nights; the snap of winter isn't far away. Although travel may be restricted during the heavy snows that infrequently blanket the Park from November on, winter can be a most rewarding time in the Smokies.

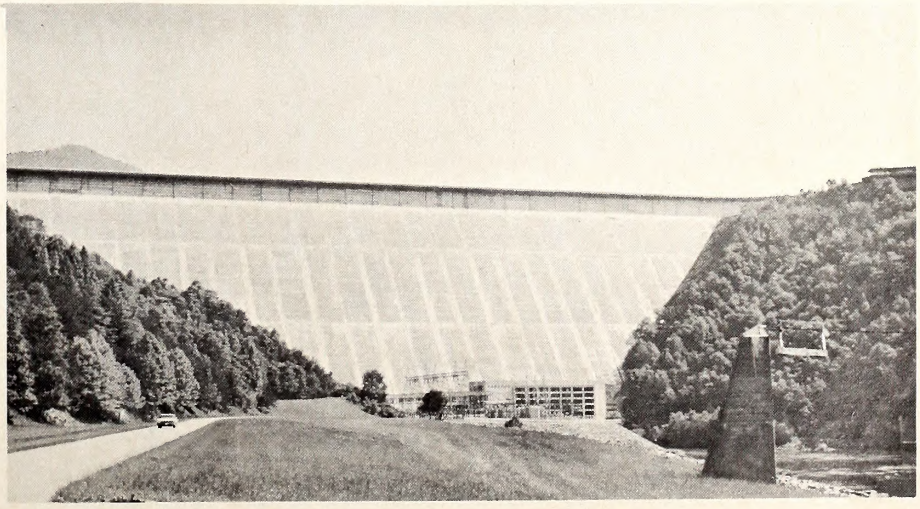
Signs posted about the bears in the Park are for your protection. This great resident of the Smokies makes frequent appearances along the higher roads, hoping for a handout. Trouble is he doesn't know where the handout stops and the hand begins! Don't feed him! (Besides, it's illegal.)

Many other forms of wildlife enjoy the protection of the Park: deer, grouse, foxes, woodchuck (look for them along the Blue Ridge Parkway, too) squirrels, raccoons, an occasional bobcat, and many smaller forest animals.

Many of the 600 miles of streams in the Park are open to fishing. Although the National Park Service makes no charges for fishing, persons fishing within the Park must procure the resident or nonresident State or county license issued by the Wildlife Resources Commission. Complete fishing regulations for the Park are available from Park Headquarters, Gatlinburg, Tennessee. These are often revised from year to year, and it would be well to have a current copy before fishing.

The Park is ours to enjoy, but with this enjoyment comes a responsibility to protect its beauty and wilderness. Be careful with fire, drive carefully, observe all Park regulations; they're for *your* protection, too ⬍

Side trips in the air-conditioned Smokies might include visits to trout-filled Cheoah Reservoir, just below Fontana Reservoir, whose mighty dam is shown here. These man-made waters offer fine aquatic sports in magnificent scenery.



CONSERVATION IN ACTION

This is a story that is repeated at military bases throughout our State and Nation. A salute here to the U. S. Marine Corps.

by H. W. Bushwitz
Major, USMCR

PHOTOS BY U. S. MARINE CORPS

OVERHEAD, piercing the powder-blue skies, sleek jet aircraft are skillfully manuevered by Marine Corps pilots. Continued round the clock activities on the ground further prepare these men to defend our Nation's freedom. This is the U. S. Marine Corps Air Station at Cherry Point, North Carolina. All this efficient hustle and bustle centered around national defense would seem to leave little time for thoughts about fishing, hunting and natural resource conservation.

Yet, the Air Station maintains a complete program of sport and commercial fishing, pond construction and maintenance, planting for wildlife, managed hunting, and fish and wildlife protection.

Fishing within the boundaries of the Air Station continues the year round and during the 1965 season there were 279 State, 354 County and 264 Combination Licenses sold here. During the year a total of 10 commercial fishing permits were issued to civilians. These permits allowed netting operations within Station boundaries. Rockfish, (striped bass), speckled weakfish (trout), shad, mullet, shrimp and blue crabs were taken.

Approximately 900 persons participated in sport fishing in the waters of Bartlet, Burns and Snake Ponds, and Slocum and Hancock Creeks during the year. A wide variety of fish provided good fishing to the angler and the catch included flounder, perch, bluegill, carp, and gar. A total of thirteen sport fishing permits were issued to civilians for fishing in Slocum and Hancock Creeks.

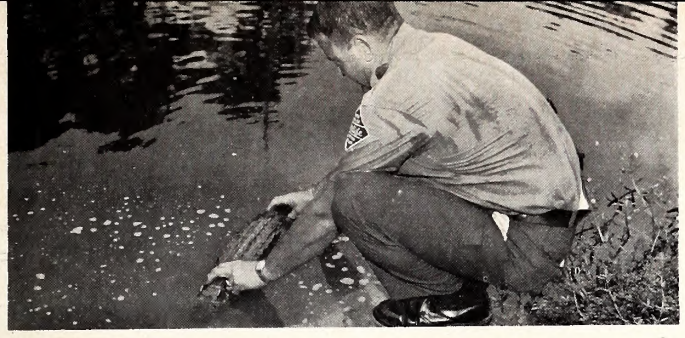
An interesting project was carried out on Burns Pond, supervised by the U. S. Fish and Wildlife Service. It consisted of a controlled feeding program for channel catfish. Sampling conducted during July of last year showed that the average catfish was 10 inches long. On the 22nd of July, the pond was officially opened to fishing. Well-conditioned catfish of 16 to 18 inches were taken giving high expectations for the current season. On October 28, the pond was restocked with 1500 channel catfish and fishing pressure remained heavy.

Vegetation-fringed six-acre Snake Pond was officially opened for fishing on July 20 of last year with good catches of bass and panfish reported. Fish population checks are made periodically. Bartlet Pond remained open to fishing all last year with good catches reported. A fishing rodeo, held on May 29 for youngsters up to 16 years of age, attracted 174 children who caught 11 bass and 401 bluegills.

The Air Station has within its boundaries some fine upland and big game hunting areas. Records show that 435 State, 314 County and 264 Combination licenses were sold on the Station last year. Hunting aboard the Air Station was conducted from September 11 through March 1, and during this period 1,069 free lance hunters killed 923 squirrels, 86 quail, five rabbits, and one raccoon. There were 16 organized

Under the supervision of Fish and Wildlife Service biologist, Alex Montgomery, base personnel sample Snake Pond.

Regulations are taken seriously on the base; here Marine Corps Game Wardens check a Leatherneck's fishing license.

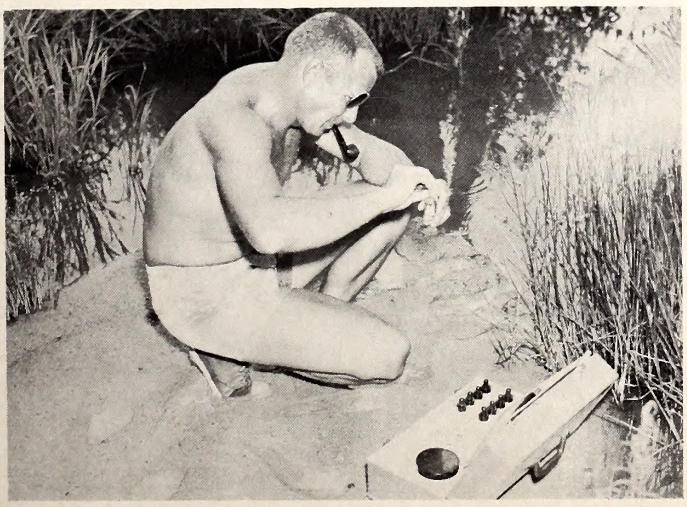


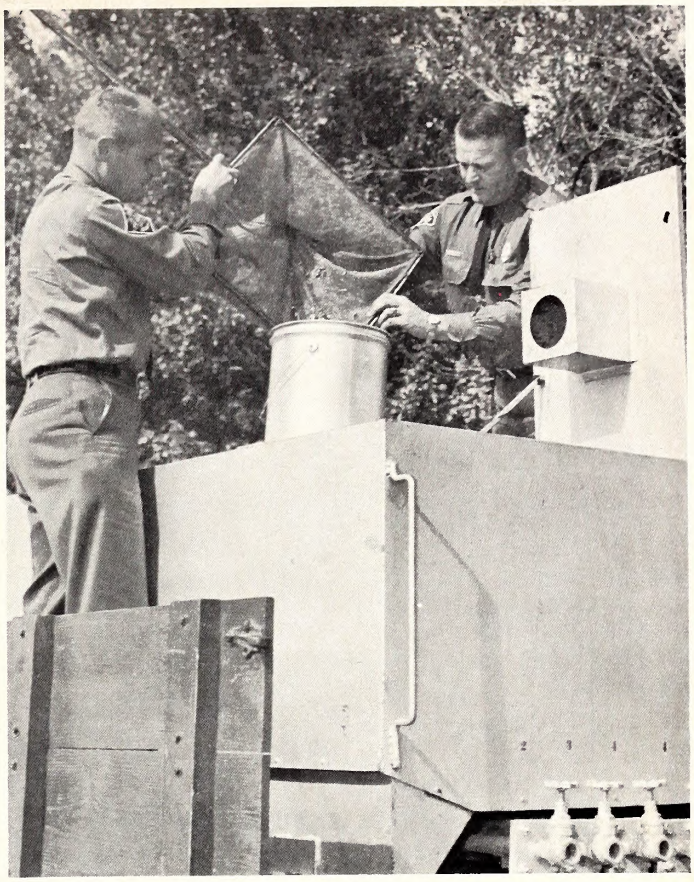
Management extends to all wildlife on the area and here, Wildlife Protector John Willis relocates a four-foot alligator.

deer hunts during which 403 hunters killed 35 deer (20 bucks and 15 doe). In addition, one deer was killed illegally, one killed by airplanes, one by dogs, and six deer killed by automobiles. The Station was again confronted with the problem of deer on aircraft runways. However, deer repellant was applied with good results.

Conservation personnel on the Station planted 50 acres of wildlife food plots, 20 acres of winter rye grass and set out 3,000 lespedeza seedlings and assisted the Commercial Fisheries Division of the Department of Conservation and Development in removing some 700 fish net stakes from the mouth of Slocum and Hancock Creeks. Wildlife Protector J. B. Willis was assisted in stocking the waters of these creeks with bluegill fry. District Biologist Sam Poole checked the food plots and offered advice on our continuing program. Cooperation with State and Federal authorities was excellent. This is conservation in action.

Varying water conditions are present on the base, and frequent water analysis checks are made to determine best fish and wildlife management procedures for each pond and stream.





Wildlife Protectors prepare to stock bluegill fry in a newly managed pond on the base. Experimental stocking of channel catfish by the U. S. Fish and Wildlife Service resulted in this catch from Burns Pond on opening day.

North Carolina's Primeval Forest

by Darrell E. Louder

PHOTOS BY THE AUTHOR

ON the western edge of Graham County in the westernmost part of North Carolina lies a 3,800 acre tract of virgin timber known as the Joyce Kilmer Memorial Forest. This ageless forest, containing an estimated 23,425,000,000 board feet of lumber, never touched with an ax, lies where the Snowbird and Cheoah Mountains join the Unicoi Mountain Range. It was dedicated as a living monument on July 30, 1936 to Joyce Kilmer, a soldier and poet, who was killed in France on July 30, 1918. To us, Joyce Kilmer was best known for his poem "Trees".

The Joyce Kilmer Memorial Forest can be reached either from Robbinsville or U.S.-129 near Topoco by Forest Service roads. The trip from Robbinsville is memorable as the gravel road winds up over a high mountain gap and down through a moss covered rock gorge, where it crosses Big Santeetlah Creek, prior to entering the forest. Just before entering the sanctuary is Horse Cove Campground, a Forest Service campground, where one can camp away from all the noises of everyday life.

As you step out of your parked car, you immediately sense a stillness from the nearby mountain. From the parking area, a trail leads upward through the forest. As you press inward, the shadows deepen and all that is heard is the sound of clear water running over boulders as it tumbles down the mountain side, the faint chirping of birds high over head and the hum of insects as they go about their daily routine. As you progress inward, you sense the closing in of the rhododendron, mountain laurel, and ferns under which wildflowers peer from the forest floor. Nearby, a giant hemlock measuring in excess of five feet in diameter, lies still, fallen as a result of time and decay. You push on, cross a small stream and suddenly—there you are—looking face to face at giant hemlocks and yellow poplars whose branches extend some 200 feet above you.

Upon reaching the massive yellow poplar grove, you will take the path to the right which passes hemlocks that have trunk diameters in excess of 76 inches and yellow poplars with circumferences in excess of 22 feet. The trip around this path will take about 30 minutes and you will pass over fallen giants and between massive trees. Below on the damp, cool forest floor, leaf mold in excess of a foot deep and over a century old, large stumps and logs which have rotted to black mounds of organic matter, and mushrooms and ferns lie unmolested by time and man. Here you sense a land like our forefathers enjoyed before us—untamed, wild and natural—a true forest climax.

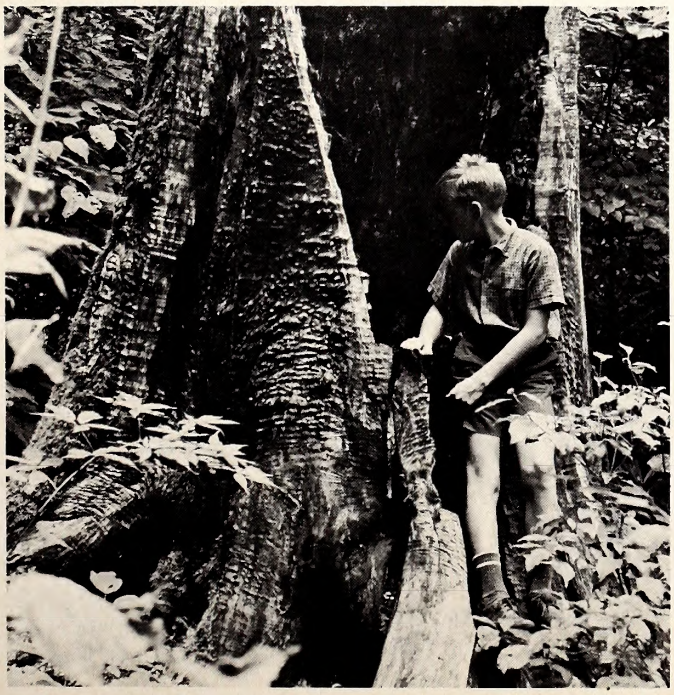
Moving on down the path you come to a large granite boulder, behind which a mammoth hemlock sentinel guards the memorial plaque which reads:

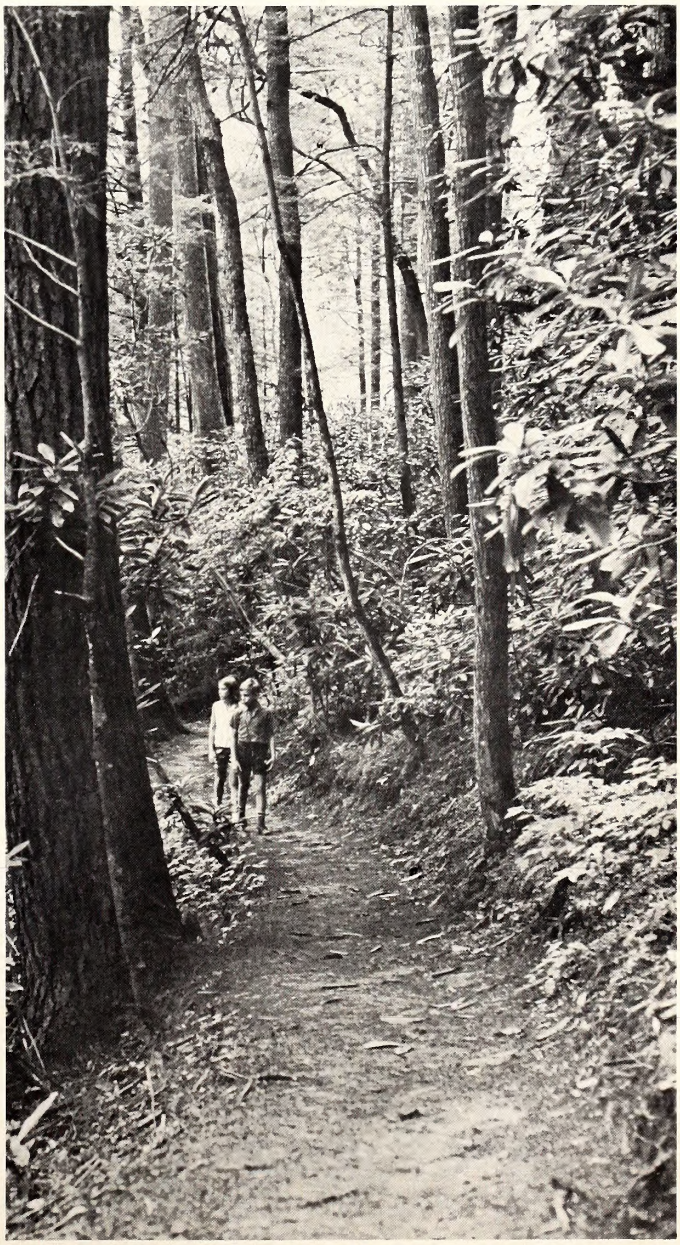
Joyce Kilmer
Memorial Forest
Dedicated July 30, 1936
Joyce Kilmer
165th Infantry, Rainbow
Division, Soldier and Poet
Author of "Trees" Born in
New Brunswick, N. J., December
6, 1886, Killed in Action in
France July 30, 1918
This Memorial was initiated
by Bozeman Bulger Post,
Veterans of Foreign Wars
and was selected by the
U. S. Forest Service

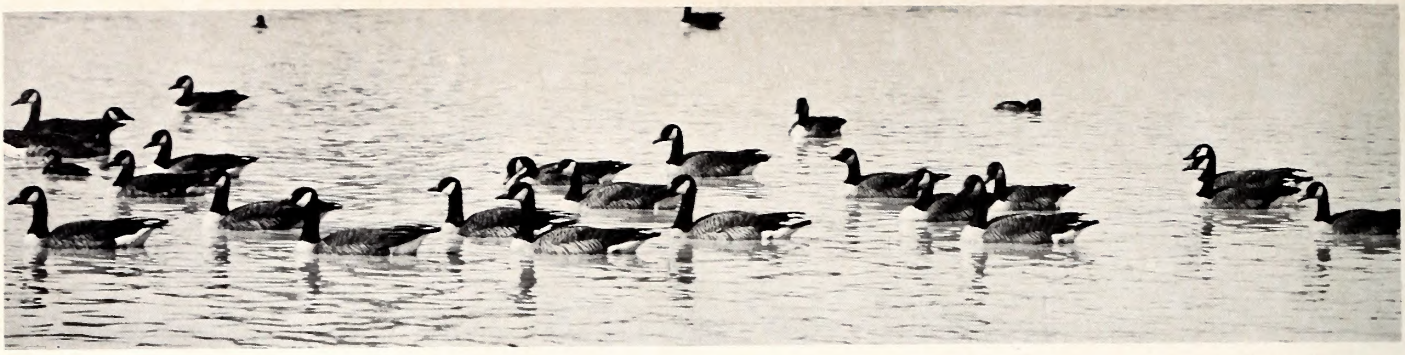
Now you have seen the primeval forest and you start your gradual descent through the forest to the parking lot below. Yes, you will always remember your visit to North Carolina's virgin forest and as the months and years pass by, you will long to return once more to an untouched segment of a true Southern Appalachian forest.

Two giant yellow poplars towering 150 feet, and having circumferences of more than 20 feet, dwarf these interested youngsters. The trail leads upward, the shadows deepen; except for the gurgling sound of brooklets, hum of insects, all is still.

Above, a rustic log bridge spans Little Santeetlah Creek. Lightning likely gutted this forest giant in the distant past. (below)







THE HONKER - Game Bird of the Future?

by C. E. Addy
Atlantic Flyway Representative
Bureau of Sport Fisheries and Wildlife

PART 2

TO provide wide distribution of birds and maximum hunting portunity there should be substantial flights to wintering areas in the Coastal Plain and Piedmont regions as far south as northern Florida. The establishment and maintenance of prosperous wintering flocks on good habitats in the deep south, however, is handicapped by two major influences. One detrimental factor is that good habitats in the northern and central part of the Flyway attract some of the southern migrants and tend to hold them through the winter. Another factor, perhaps the most influential of all, is that the goose flocks with the longest migrations often get shot too heavily. For example, the St. Marks flock in Florida (which has declined from 25,000 to 6,000). This decline in the population could have been due primarily to the fact that all the allowable harvest was taken from the flock in most years before the birds even reached Florida. The kill in Florida plus the harvest to the north in Canada and the northern states has very likely been considerably in excess of what was produced on the breeding grounds. Under such circumstances the population obviously could not maintain its numbers.

In order to increase the overall Flyway population of honkers, to develop new thriving flocks in the deep south, and have wider participation in the kill by hunters in the Flyway we have to acquire a lot of information on the migration characteristics and distribution of the birds, which groups of birds are related and which are not, when and where kill takes place, the size of the kill in different areas and how much "natural" mortality occurs. Kill surveys, aerial counts and increased banding on the Canadian breeding grounds and wintering areas in the Flyway are being given a push to get information needed.

With an area as large as eastern Canada and the Atlantic Flyway it is reasonable that geese using some sections of this vast area may not fare as well as geese associated with other locations. As better data are obtained and we are able to define the different groups, we may find it desirable to manage some groups of geese differently from others. From the standpoint of good management, it might be necessary to have different regulations in different parts of the Flyway.

Waterfowl hunters throughout the Flyway are becoming more and more interested in goose hunting. Some state fish and game departments are making positive moves to satisfy their hunters' desires by acquiring the real estate needed to attract geese and by providing hunting opportunity. The hunters in the northern part of the Flyway, particularly in Pennsylvania, New York State and New England are most anxious to get "their share" of the great number of birds that pass over their states in the fall enroute to wintering areas in Delaware, Maryland, Virignia and the Carolinas.

"Short Stopping"

There is plenty of evidence that hunters in some states, such as those in mid-Flyway, have had a much better deal on geese than hunters in the states to the north and south. This arrangement however, will not last indefinitely because it is certainly possible in the north to stop or slow the flights of birds bound for traditional wintering areas. With enough areas under the right kind of management the northern states and provinces could delay flights long enough to permit the northern hunters to take most of the allowable harvest. In other words, it is quite feasible for the folks in the north to cut off the supply of birds to the rest of the Flyway.

To the dyed-in-the-wool goose hunter in North Carolina such a prospect would be a revolting turn of events. Nevertheless, it is clearly in the cards that this could happen. Therefore, it's real important that all states and provinces and the two federal agencies get together and agree on a workable management plan. Such a plan would attempt to increase the number of birds, encourage strong migrations and provide for a reasonable, equit-

How do we in the South get the honkers? Several ideas come out here.

able distribution of the kill between Canada and the United States and between the states of the Flyway.

So much for what we would like to see happen. The big question is how to bring it to pass. When considering the problem it is good to keep in mind that compared to ducks and other natural resources, we are dealing with a relatively limited number of birds. Even if we had a fall flight in the future of a million honkers coming from the breeding grounds the most that we and the Canadians could take in an average year would be 250,000-300,000. If we wanted to continue building the population we would have to take less in order to allow more breeders to return to the breeding grounds. As more management areas are established during the next few years and as more and more hunters participate, the kill could rapidly exceed the annual production of birds. In this event, it would naturally follow that reductions in season and bag limit would be required to hold the over-all kill within safe limits.

Applying more restrictive regulations in the Flyway in both Canada and the United States would probably do the job of preserving good population levels. But this approach alone would not begin to cure the distortions and inequities present. Perhaps, it might be desirable to delay the opening of the season throughout the Flyway until many of the birds had completed their migration. If this approach would work it would give hunters in all areas in the Flyway an opportunity to harvest their share.

In all likelihood, however, these general approaches alone won't do the job required. It is quite possible that without more specific control of the kill and control of the kind of habitat management carried out, populations in the southern half of the Flyway would "dry up" due to "short stopping" and over-harvest. It would seem that if we want to develop and maintain strong goose flights and make it possible for hunters throughout the Flyway to hunt and harvest a share of the birds, the only sensible solution is to set state or regional kill quotas in addition to having delayed opening dates and other general regulations. In other words, if our aim is to have hunting of the honker throughout the Atlantic Flyway and not just at a handful of concentration areas, there has to be some way to make sure that enough "surplus" birds are allowed to get to the hunters all the way down to the end of the line. Very likely some sort of compulsory tagging system could be devised whereby only so many permits would be issued per state. All geese killed would have to be tagged immediately in the field and the kill reported.

At first blush, the tagging idea is a bit repulsive. It smacks too much of further regimentation and artificiality. But, looking at it another way, the honker is a magnificent bird and should always be held in esteem as a prized trophy. From this standpoint, I should think that requiring a tag and a report really puts this grand bird in a special class by itself among waterfowl.

Let's Make Every Bird Count!

If there aren't going to be enough Canadas to supply the demand, the obvious conclusion is that we must husband the resource with care. This applies to the hunter as well as the wildlife manager.

Most Canadas, once they are on the wing in late summer apparently experience relatively light losses from "natural" causes such as predation, disease and starvation. On the other hand, losses due to man (other than shooting) can sometimes be important in some localities.

Perhaps the two most serious man-caused losses are birds shot but not retrieved (crippling losses) and birds that die as a result of eating lead shot. Waste of Canadas from these two causes isn't as great as with some duck species. However, a bird lost from such causes is one less bird for the hunter. It behooves all of us when hunting to make "clean" kills, shoot only when the bird is well within killing range and force ourselves not to shoot in situations where the chances of finding or retrieving a downed bird are not good.

Millions of waterfowl have experienced lingering deaths because they picked up some lead shot pellets when feeding. Some species suffer greater losses than others from lead shot poisoning. Where the Canada goose falls in relation to other species in this regard is difficult to say. In any event, it is encouraging to note that the ammunition industry is aware of the problem and is working on the development of a non-toxic shot which would take the place of lead in all shot shells.

A Parting Word

In the management of the resource the wildlife manager has adopted many of the terms used in agriculture and other businesses. Such terms as "harvest", "production", "harvestable crop", "surplus" and "supply and demand" are in common usage. It's as though wildlife is a commodity to be produced and sold in the market place. Perhaps, to the manager, this is natural and necessary because somewhat the same mathematics and rules apply in most types of management programs. But when it comes to the hunter and hunting activity we should view the honker, not as a head of livestock, or a piece of merchandise but as a free-ranging wild bird in his natural wild environment. Let's not concentrate the birds to such an extent that they lose their natural wariness, become paupers and can be bagged by the hunter as easily as any barnyard fowl. No, let's do all we can to maintain inherent wildness and make the bagging of a Canada goose possible only as a result of much effort and skill on the part of the hunter. Let's keep the magnificent honker as a trophy bird much sought after by those of us who love the sport. ⬍

WHO WANTS A GAME FARM TURKEY?

by R. Wayne Bailey
C. Eugene Kroder

Reprinted from West Virginia *Conservation Magazine*

PHOTO BY LUTHER PARTIN

WILD turkeys are like money in one fundamental respect—there never seems to be enough. Many state and private organizations attempt to increase their number through the release of game farm, or hand-reared birds. Some 20-25 states have had wild turkey restocking projects at one time or another and there is now conclusive evidence to indicate that the release of game farm turkeys not only *fails to accomplish its purpose but when made in an area already occupied by native (wild) birds may actually do more harm than good.*

Let us review the basic facts. We have the practical experience of some 20 to 25 state conservation departments that have stocked thousands of game farm turkeys during the past 30 years. More important as far as an understanding of the problem goes, we have analytical studies by competent biologists as to the reasons why game farm turkeys have failed and why they are dangerous to established wild populations.

First, let us look at some examples of stocking game farm turkeys.

In connection with the CCC program of the 1930's West Virginia produced and released game farm turkeys by the hundreds. The results were so discouraging that the entire project was terminated even before abandonment of the CCC program. In the late 40's and early 50's more than 10 years after any substantial releases had been made, the state's turkey population began to expand in area and density. This expansion was undoubtedly due to improved quality of the range as a result of maturity forest.

That the habitat was suitable is proved by the fact that transplanting only a few turkeys of purebred wild stock has been outstandingly successful. "Saturated" populations, that is, all that the habitat would support, occurred on limited areas the *second* breeding season following the release of 6-8 live-trapped wild turkeys. There was no failure in the four such attempts in West Virginia.

This situation appears to be generally true. Experience has shown that in areas where hundreds or even thousands of game farm turkeys failed to establish wild populations, a mere handful of live-trapped, purebred wild turkeys succeeded and quickly spread into surrounding areas.

In California (outside original wild turkey range) a total of 118 distinct releases involving 3,062 game farm turkeys was made between the years 1877 and 1951. Only four releases were successful, and of these, only one—a release of 23 live-trapped, purebred wild birds from Arizona—shows promise of sufficient vigor to provide hunting.

Between 1952 and 1956 approximately 1400 game farm turkeys were released on eight different areas in Ohio. Within two years after release all of the birds had disappeared on seven of the release sites, and only on one area do they appear to be holding their own.

Some of the leading turkey states in the South at one time had extensive stocking programs using game farm stock. Most of those programs have been terminated, and the ones that are still operating are doing so on the basis of expediency rather than from beneficial results. By and large, stocking of game farm turkeys has been abandoned by most progressive state oragnizations. To our knowledge, only two state conservation departments still stock on a large scale.

It has been amply demonstrated that game farm turkeys fail to succeed in the wild. For the answer to "why" we must turn to the results of biological research.

Purebred Eastern Wild Turkeys have never been raised in captivity *in large numbers* simply because they are too wild. In tracing the history of game farm stocks of "wild" turkeys we find that they originated by crossing domestic turkey hens with wild gobblers. This was done by penning domestic hens in areas populated by wild turkeys and allowing wild gobblers to enter and mate with the captive hens. This subterfuge was necessary to produce a "strain" tame enough to be artificially propagated. The captive strain is usually selectively bred to closely resemble the native wild turkey in form, color, weight and other *external* physical characteristics. These traits, as will be shown later, are not the critical ones that determine survival in the wild.

The failure of game farm turkeys to succeed in the wild can be traced to the presence of domestic turkey "blood" in the stock. Further investigations have conclusively shown that there are genetic or hereditary differences between wild and do-

West Virginia wild turkey biologists trace the history of game farm turkeys and how they can affect wild birds. Many of these principles apply to North Carolina turkeys.

PHOTO BY LUTHER PARTIN

A rare sight for photographers or hunter; a trio of one of our finest game birds.

mestic turkeys. These heredity differences affect the nervous system, the endocrine system and the over-all metabolism. In the domestic turkey the nervous system is dull, the brain size small, the endocrine glands are small and do not permit rapid reaction, and the metabolism, or energy producing system, is slow. These conditions produce a fat, gentle, heavy bodied bird for the table, not a wary, alert bird able to survive in the wild. The reverse of these hereditary characteristics is true of the wild bird—they possess a well developed nervous system and large brain, large endocrine glands and rapid metabolism. These traits fit them exceedingly well for existence in the wild, but poorly for captivity. In fact, due to their highly developed nervous and endocrine systems wild turkeys frequently die of "shock" in captivity. This is but one of the many difficulties encountered in raising wild turkeys artificially.

A couple of concrete illustrations may help clarify the hereditary differences between wild and domestic turkeys.

Domestic turkeys usually begin egg production the latter part of January or early February. Due to the difference in endocrine glands mentioned above, wild turkeys normally start egg production the latter part of April or early May (in West Virginia and Ohio). Domestic gobblers readily breed when they are one year old. Wild gobblers, due to hereditary differences, do not breed until they are two years old. These are but two of the many differences between wild and domestic turkeys.

As pointed out earlier, all present-day game farm turkeys are crosses between domestic and wild turkeys. Therefore, they share the heredity traits of both, and in reality are little more than half wild. When released in the wild they are, by heredity, incapable of developing a proper fear of, and ability to avoid, man and predators. Their reproductive period lies between the wild and domestic turkey; hence their young are often hatched during periods of inclement weather and fail to survive. Most game farm turkeys refuse to stay in the wild, and quickly disperse to the vicinity of farms. Is it any wonder that game farm birds fail to perpetuate themselves?

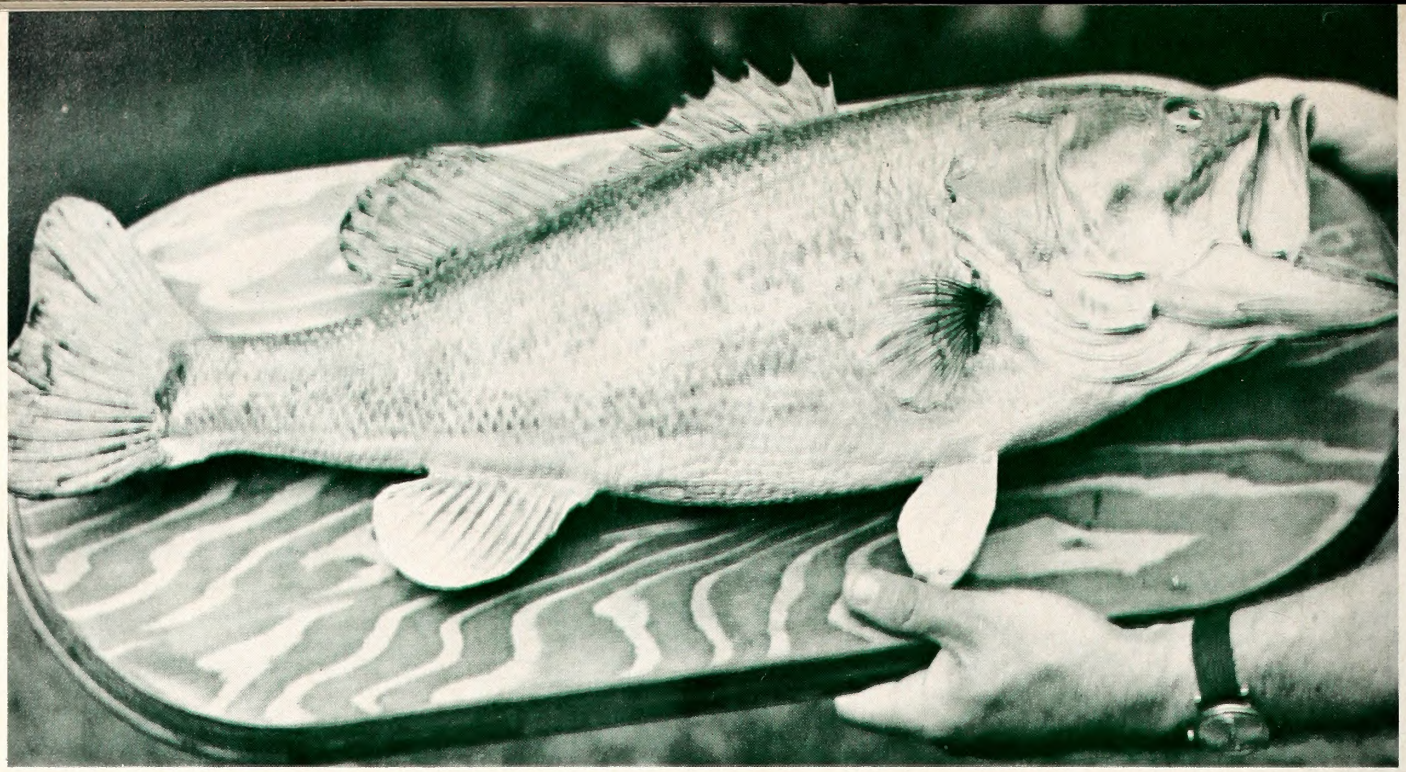
Perhaps as important as the factor of domestic heredity is the problem of disease universally present when a highly susceptible bird, such as the turkey, is concentrated in numbers as is necessarily the case on game farms. Under artificial conditions, deadly turkey diseases such as blackhead, coccidiosis and various forms of enteritis are suppressed by antibiotics and sulfas. When the birds are released they no longer receive their daily dose of germ killers, and thus die or serve as carriers of these diseases to their chicks. More importantly, they may pollute the range, transmitting the diseases to native wild stock.

If only the game farm stock released were affected by these adverse factors of domesticity and disease, we would not be faced with a serious problem. The released stock would die, be shot, or eaten by predators, and we could forget the whole matter. A waste of money would be the only result. However, when released in an area having native wild stock, game farm turkeys are likely to transmit to the wild stock, by contact, deadly diseases and, by interbreeding, a set of inferior characteristics such as lack of fear of man and predators, a reproductive cycle not in harmony with the environment, an inability to endure starvation and exposure, and other traits of domestic and semi-domestic turkeys.

It is therefore entirely possible that continued releases of game farm turkeys in an area inhabited by native stock can lower the quality of the native stock, resulting in disappearance of turkeys from the region affected.

We wish to emphasize that where pure wild stock is unavailable, the release of game-farm turkeys to establish a population in an area completely devoid of native turkeys can be justified. In such an area there is no wild stock to be "polluted;" consequently, there is much to gain and very little to lose. In suitable habitat, the outcome of such releases is determined by the amount of hereditary wildness in the stock released. Under such conditions, releases should cease when it is known that reproduction is occurring. Thus, without further pollution, and if given absolute protection from legal and illegal hunting, the pop-

• **continued on page 24**

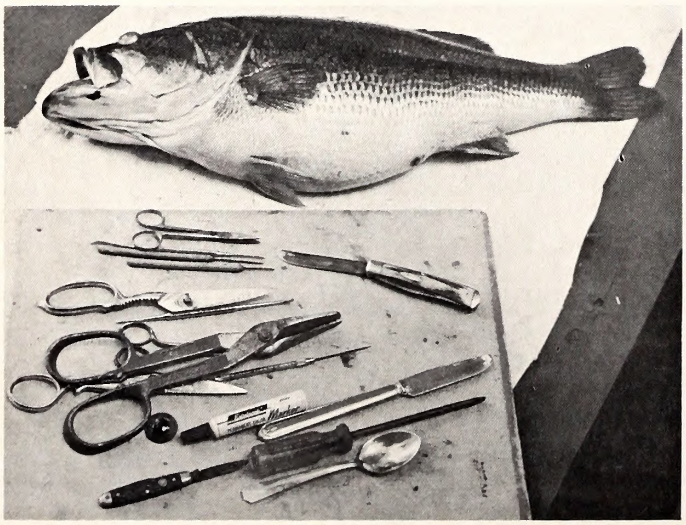


Mount That Bass

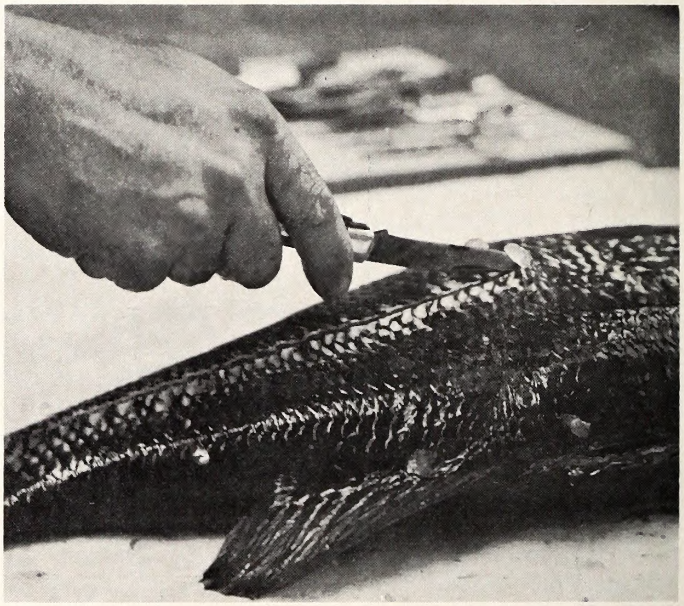
by James R. Davis

PHOTOS BY TOM JACKSON

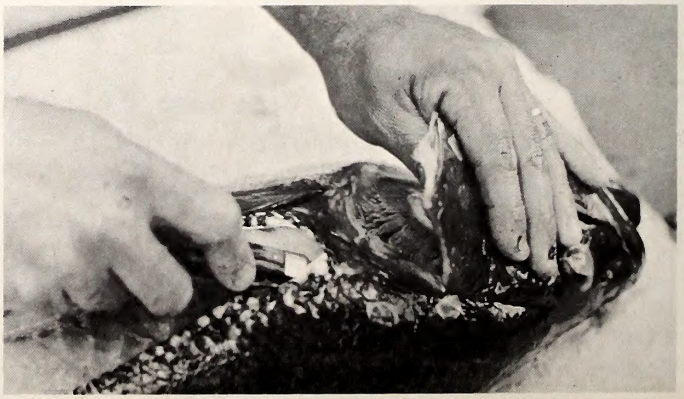
A trophy fish may show up at the business end of your line at anytime. When it does, many stories will be told, but few will be believed by your audience—unless you hang your next trophy on the wall and have the proof of your prowess. An amateur can easily do a fair job of mounting a specimen, if he doesn't want to employ a professional taxidermist. Ready to try? For this photo feature we selected a largemouth bass, a good fish to work with.

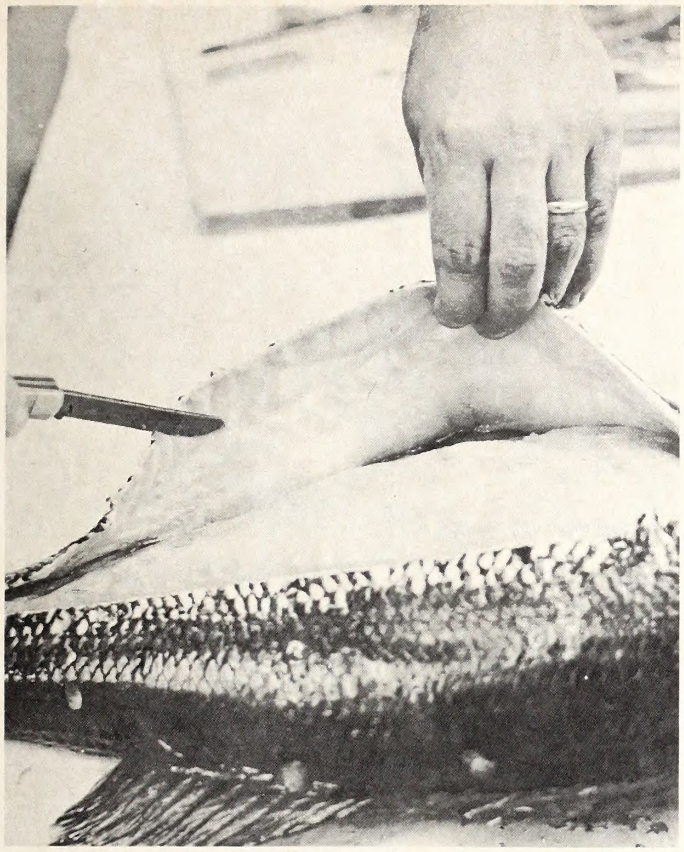


Assemble your equipment and materials in a well-lighted spot where you have a bit of room for "expansion" as the operation progresses. Select the fish's best side and place this flat on a piece of paper and carefully draw an outline of the fish for future reference. Color notes of the fresh fish will also help when the time for painting arrives. Remove the outline paper and you're ready for skinning.



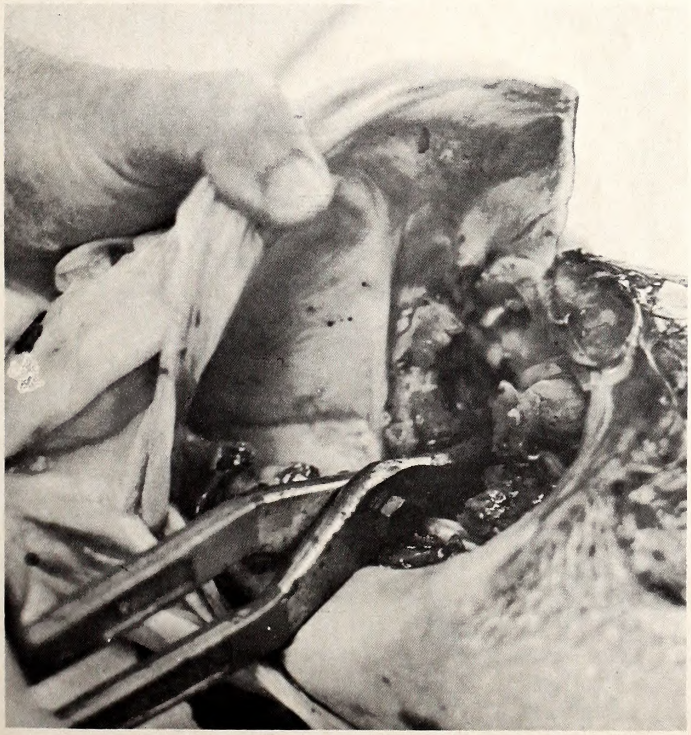
Make an incision with a fairly dull knife the full length of the fish's side. Don't worry about lost scales on the cut side, but be very careful about dislodging them on the "good" side. Also in working the knife under the skin, take care not to cut through the skin (below). Work slowly your first time out.



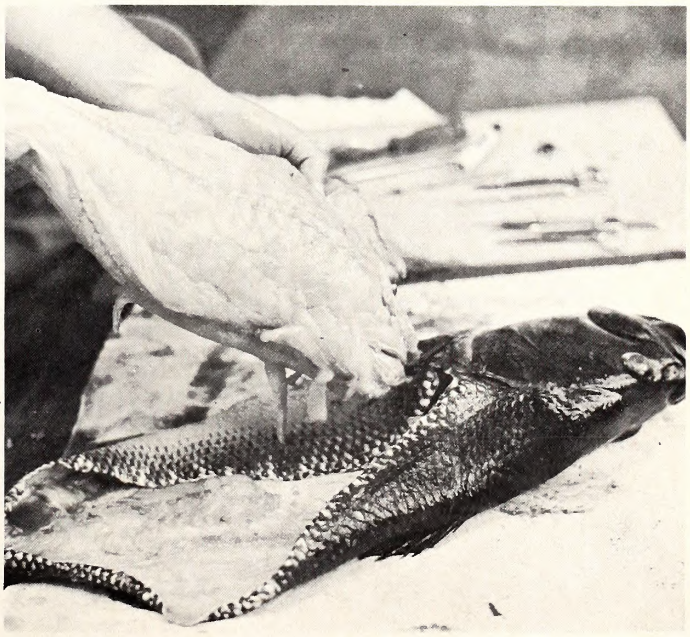


Lift up the exposed skin and work knife completely around chunk of body meat. Cut around where fins are attached . . .

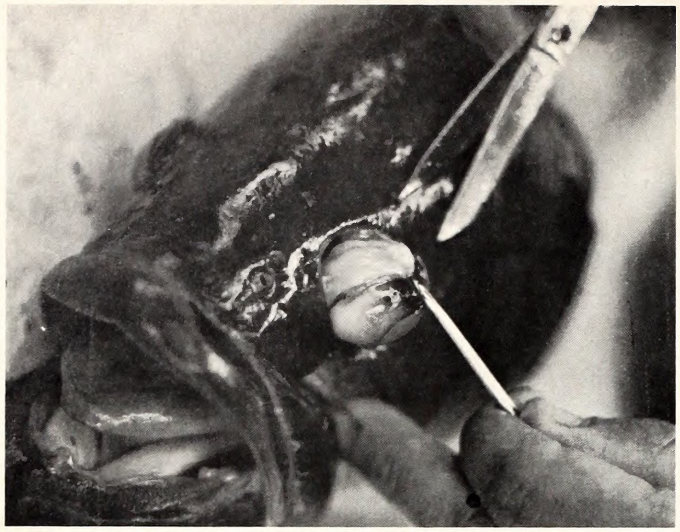
. . . then using heavy shears or tin snips, cut through all fins. This tool should be used for all bone cuts too. Fish is flat.



Still using the heavy shears, remove the gills completely, but leave the tongue undisturbed. Get out as much connective tissue as possible and clean the skullbones as thoroughly as you can.



The body should now lift out intact with most of the flesh on it. Spread the body skin open and carefully scrape out all the rest of the meat and fatty tissue. Any flesh left will likely ruin the skin and may spoil the entire mount.

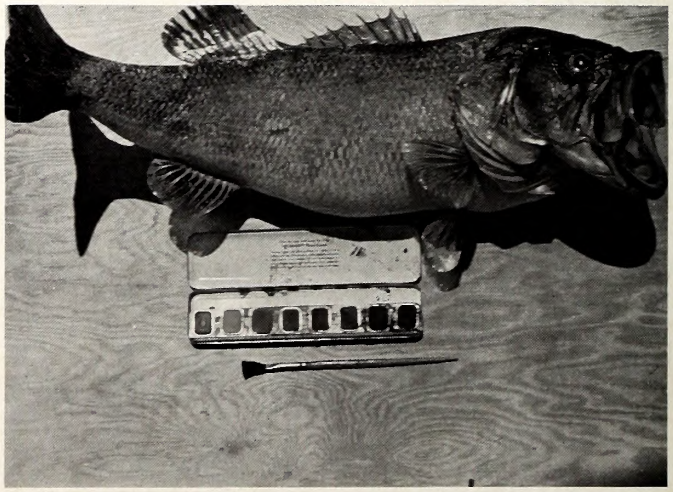


Remove the eyeballs and cheek muscles without disturbing the surrounding tissue if possible. Remember the position of the eyes in the sockets for later replacement with glass eyes.

Apply borax liberally and often to all areas of the skin. Rub it into the hard-to-get-to spots of the head and gill region. It won't damage the display side of the fish and will wash off.

With wood excelsior, make a body the same size and shape as the skinned out piece. Wrap the excelsior with cotton twine to keep it in shape. Before the body is completely wrapped, add a small board to the back side of the body; this will support the fish on its panel when it is completed. Work the excelsior body into the fish skin, adding extra excelsior where needed. Make sure the exposed body surface is smooth and firm.

Sew up the body incision with a heavy needle and strong thread, beginning at the tail. Replace cheek muscles with excelsior. Adjust the fins in the desired position and pin them between cardboard pieces as shown. Allow two weeks to dry fish thoroughly.



Once mount has dried, remove pins and cardboard, back fins with cellophane tape and set eye (painted) with wax. This wax can be used to patch any blemishes also. Paint carefully, using just enough to add subtle colors. Oils work best. Allow paint to dry thoroughly and add a coat of clear varnish or Krylon spray.

NORTH CAROLINA WILDLIFE

RESOURCE-O-GRAM

A ROUNDUP OF THE LATEST WILDLIFE NEWS

Don't Get Caught Short!

The Wildlife Resources Commission reminds Tar Heel sportsmen that those who have been fishing on a combination hunting-fishing license need a new one as of August 1. Hunting licenses and combination licenses are on sale at more than 1,000 license dealers throughout the state. While fishing licenses are valid on a calendar year basis, hunting and combination hunting-fishing licenses are valid from August 1 through July 31.

Copies of non-migratory hunting regulations are available from license dealers. Regulations for migratory game birds are established by the U. S. Department of the Interior, and copies will be available from the Bureau of Sport Fisheries and Wildlife, Washington, D. C., from your local wildlife protector, and from the Commission's Raleigh office.

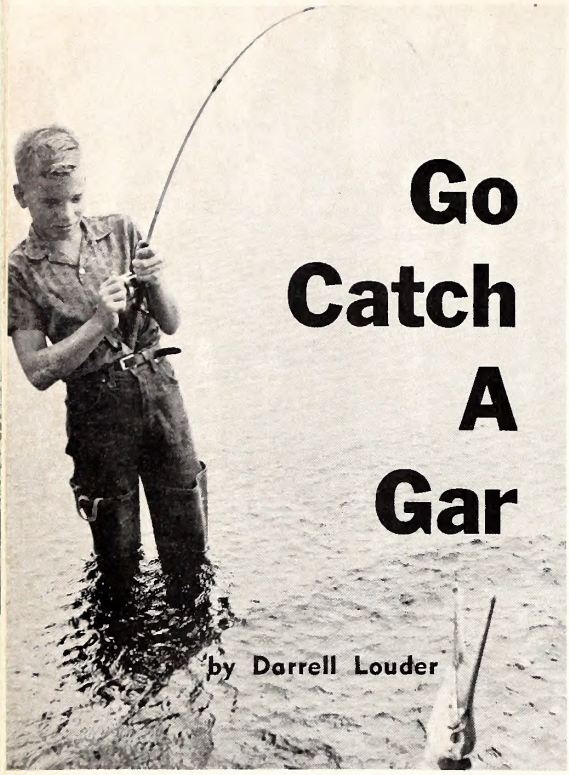
Water Safety Committee Meeting Scheduled

Clyde P. Patton, director of the Wildlife Resources Commission and chairman of the Governor's Water Safety Committee has announced a meeting of the Committee on or about August 31. The Committee will hear reports from sub-committee chairmen on boating safety problems in the various types of water where water-related accidents occur.

Cooperation Requested

The Wildlife Resources Commission has requested public cooperation in reporting violations of the fish and game laws. On the back of your hunting regulations is a list of 14 telephone numbers at which violations may be reported. A Wildlife Commission radio operator will take your call and relay the information by short-wave radio to the wildlife protector nearest the scene of the violation. In case of long distance calls, call collect and inform the operator you wish to report a violation. The Commission has a statewide radio hookup for transmitting messages either directly or by relay.

Location	Area Code	Telephone	Location	Area Code	Telephone
Edenton	919	482-3687	China Grove - Landis	704	857-9188
Washington	919	946-4744	Pinebluff	919	281-3568
Burgaw	919	259-4423	N. Wilkesboro	919	838-4618
Rocky Mount	919	442-4745	Valdese	704	437-3215
Fuquay-Varina	919	552-5028	Marion	704	697-7311
Elizabethtown	919	862-3826	Waynesville	704	456-9292
Burlington	919	228-8523	Raleigh	919	829-7191



Go Catch A Gar

by Darrell Louder

IF you have tried bass, bluegill, or crappie fishing this summer, had poor luck, and are now fed up with fishing in general, then try your luck at gar fishing. Sound silly, or you think it might not be sporty? You're wrong. The longnose gar can give you a battle equivalent to a rambunctious largemouth bass on the end of light spinning tackle.

Just what is a longnose gar and where did he come from? Somewhere between 35 and 190 million years ago, a family of fishes known as the Semionotide gave rise to a number of important offshoots. Most of them flourished for a time and then perished. Of this group, two families of fishes —the bowfins and the gars—have been able to take the measure of time and have survived. In the gar family there are eight species, of which the longnose gar is the most abundant and has the widest geographical distribution.

The gars can be distinguished from the other fishes by their thick, diamond-shaped, bony scales. The gar's jaws are extended forward into a beak, equipped with strong needle-sharp teeth.

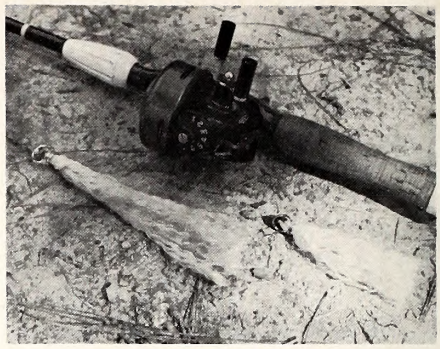
Another unique factor about this fish is that it can live out of water for a short period of time by gulping air into its primitive lung or air sac. During warm weather and periods of low dissolved oxygen in the lakes and rivers, the gar can be observed with the tip of its snout protruding about the surface of the water.

Where in North Carolina do you go to catch these denizens of the past? The best gar waters in North Carolina are in the eastern part of the State, with the bigger gar being found in the blackwater rivers and natural lakes. To name a few choice gar spots, I would suggest the quiet-water areas off the Lumber River near Lumberton, Lake Waccamaw in Columbus County, the lower Cape Fear River near Lock and Dam No. 1, Neuse River near Kinston, Whites Mill Pond near Scotland Neck, Lake Phelps in Washington County and the Catawba Reservoir below the outfall of Mountain Island Reservoir.

To catch gar, you first have to locate a school of these big fish when they come to the surface to gulp air. Once a school of gar is located, ease your boat into position by sculling and anchor it so that it does not drift away from the school, which usually remains in the immediate vicinity.

The most preferred bait in North Carolina is a large golden shiner. The shiner should be filleted with the skin and scales still in place and hooked on a number 2/0 hook. The hook should be attached by a double leader, inasmuch as the gar's sharp teeth will sever a single line. Casting or spinning gear are ideal and in most cases, 15 to 30 pound test line will suffice.

Once rigged, cast the filleted shiner into the area of surfacing gar. The baited hook will sink slowly among the fish. If the bait is not picked up after the line reaches about a 40 degree angle, then retrieve the bait slowly, stopping periodically on the retrieve. This slow retrieve entices the gar to pick up the bait. In order to hook a gar, the fish must first swallow the baited hook, so let out plenty of line and take your time. Let the gar think he is getting an easy meal. Remember, the longer the fish runs with the line, the better are your chances of landing him.



These are examples of homemade lures used for longnose gar. Their teeth entangle in the frayed nylon rope fibers.

Longnose gar in North Carolina have an average weight of 8 to 15 pounds, while one in excess of 20 pounds is not too uncommon.

Another method of taking longnose gar with casting or spinning gear is to use a homemade artificial lure. Take a piece of nylon rope (3/8 inch in diameter) and cut it into several four- and five-inch pieces. Melt one end of each piece with a propane torch so it will not unravel. Place a sholt ring into the end that has been melted just behind the sealed area. This will act as an attachment to the leader on your casting or spinning rig. Now add two more sholt rings around the entire diameter of the rope in back of the hook-on ring. Now unravel the rest of the short rope and brush it until the nylon fibers are unwrapped. No hooks are needed. Just cast the homemade nylon lure into the schooling longnose gar and twitch the rod tip. This makes the lure move like an injured minnow. Once the gar strikes the lure, its teeth become entangled in the nylon fibers and the fight is on.

Remember, if it's action on the end of a spinning or casting rod you want, go to a river or lake where the longnose gar are concentrated. Put on either a hook with a filleted minnow or nylon rope lure and cast into one of the surfacing schools. Look out! You may be in for a thrill of a life time.

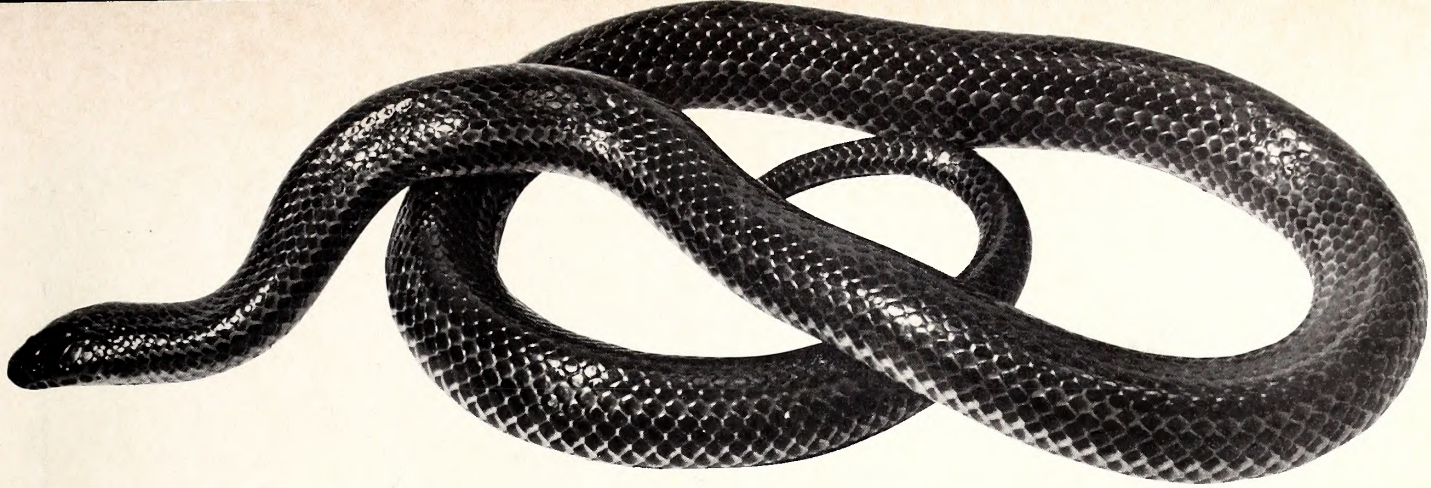


PHOTO BY JOEL ARRINGTON

The Rainbow Snake

by Franklin F. Snelson, Jr. and William Palmer
Cornell University and N. C. State Museum of Natural History

AMONG the most colorful and inoffensive of all serpents is the rainbow snake, *Abastor erythrogrammus*. This attractive species and its close relative the mud snake possibly are the forms accused in myth and superstition of taking the tail in the mouth and rolling along in the fashion of a hoop, or of possessing a poisonous "stinger" in the end of the tail which can be extruded and withdrawn at will.

Such tales are the product of a vivid imagination to say the least. It is anatomically impossible for any snake to move about in such a ridiculous manner. Furthermore, no species has yet been discovered with any terminal appendage even remotely resembling a "stinger." Both the rainbow and mud snake do, however, possess a noticeably pointed spine at the very tip of the tail, but this structure is in no way harmful and possibly is employed to maneuver soft-bodied prey into suitable positions for swallowing. In addition, both of these species are among the few large harmless serpents that do not bite even when first caught.

Most appropriately named, the rainbow snake is truly a beautiful creature. The background coloration is shiny, irridescent blue-black with three longitudinal red stripes. A yellow band extends along each side where the ventral scales meet those of the dorsum, and the underside is red with a double row of black spots, a pair on each scale. A single row of black spots, most prominent in male specimens, is situated down the center of the belly. Conspicuous black spotting is evident on the labials (lip scales). Adult individuals average about 3-3½ feet in total length and the largest examined from North Carolina measured almost 4½ feet.

This species ranges from southern Maryland south in the Coastal Plain to eastern Louisiana. It is generally uncommon throughout most of its range in eastern North Carolina where it has been recorded as far west as the Sandhills.

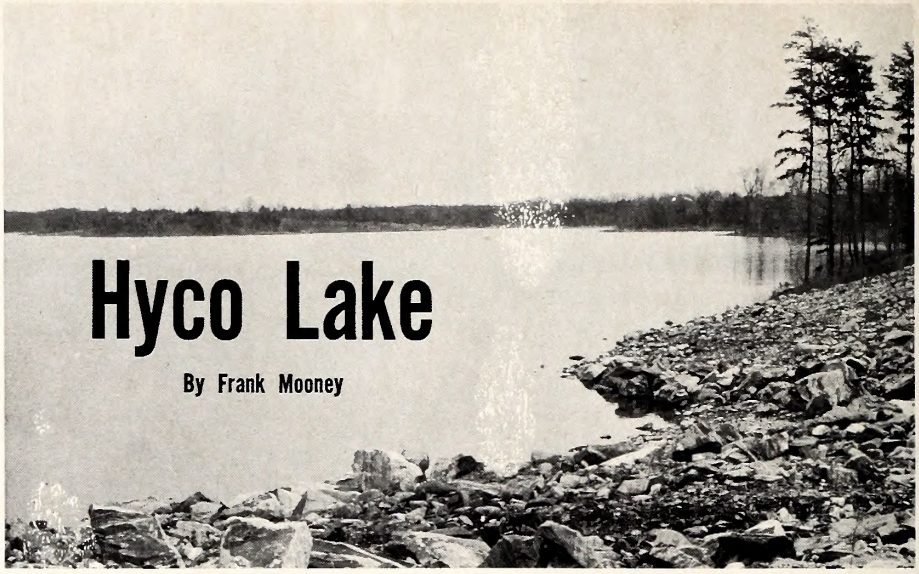
Rainbow snakes are among the most aquatic of our native species and are seldom found any appreciable distance from water. In fact most specimens that we have observed were actually swimming or apparently foraging along the bottom. They are sometimes discovered prowling near water or crossing roads through moist bottomlands during or immediately following periods of heavy rainfall. Individuals occasionally are uncovered beneath logs, scrap pieces of tin, or similar shelter either in the water or very close to it along the banks of lakes, streams, and rivers. During the early spring rainbow snakes are said to be sometimes unearthed during plowing in sandy fields bordering aquatic areas. The species is most often active at night.

When first captured, specimens make no attempt to bite, but instead thrash about wildly during which time the tail is pressed against the collector's skin. The pressure of the terminal spine is definitely noticeable, and to some possibly even startling, but entirely innocuous and unable to cause injury or even discomfort.

Very little is known of the breeding habits in this state. Presumably mating takes place in the spring and as many as 50 or more eggs are laid in sand or decaying debris during the summer. Hatching probably occurs in the early fall.

The food of adults consists largely of eels, but tadpoles, frogs, and salamanders possibly also are included in their diet. Struggling prey is subdued by constriction in much the same manner as employed by the kingsnakes and rat snakes.

We have had very little experience with rainbow snakes in captivity but specimens are said to do well if provided with proper food and housed in a large aquarium containing sufficient water for the animal to submerge. A juvenile kept under these conditions at the State Museum passed most of its time under water hiding beneath a floating piece of cork bark from which it would strike out and feed voraciously upon small salamanders.



Hyco Lake

By Frank Mooney

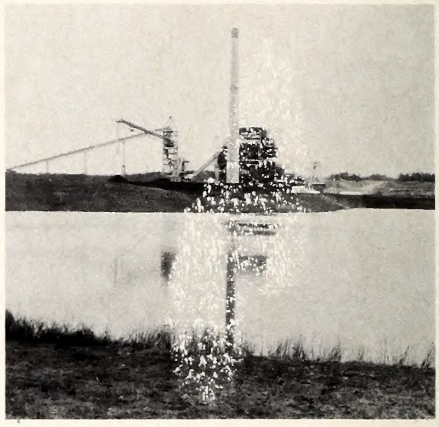
IT gladdens the heart to see some new natural resource made available to the waiting outdoor enthusiast. In this modern day when agriculture and housing developments are fast destroying our wildlife habitats and turning our virgin forests into second-hand growths of sawdust piles and tree laps, there seems only one way for all wildlife. Our population explosion has made housing development a necessity, but is it necessary to drain our swamps and marshland for farming when in reality they are suitable for wildlife breeding grounds? When the government already is paying millions of dollars for storage and support prices on surplus food, more "production" is a bit difficult to understand. Our fast diminishing wildlife is fighting a losing battle if draining and other questionable activities continue to squander their habitat.

Hyco Lake consists of 3,750 acres that meander through Person and Caswell counties, filling the once dry gorges and untillable lowlands, helping to beautify the landscape, while giving the surrounding counties a valuable playground. Carolina Power and Light Company started the project early in 1963. The lake filled to the anticipated level the latter part of 1965. Two beaver ponds were cleared and flooded, with their fish populations helping to stock the lake. The crew that cleared the swamp excavated routes for the water to drain low enough (yet high enough to safeguard the fish) to bring the equipment necessary to efficiently do the work. They returned next morning to find the holes plugged during the night by the industrious beavers. Precautions had to be taken and finally the beavers were dispersed, unharmed but wiser, to less formidable range.

THE recreation of the lake was turned over to a five-man board, three from Person County and two from Caswell. About 90 percent of the lake lies within Person County boundary with the remaining 10 percent in Caswell. This lake is located about 12 miles north of Roxboro. In June of 1965, 65 acres were leased from CP & L by the board for 25 years as a recreation park. This park is still in the planning stage. The steam generating plant will pump the hot water back into the lake through canals, some of which are located under the lake bed and will enter the lake at different locations. The hot water should have no ill effect on the fish population and will change the over-all temperature only a few degrees. Hyco Lake now covers the Hyco River bed, the initial course of current flow.

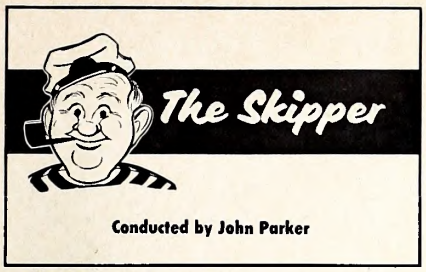
The river was known for its large carp and catfish but the stream also had bass, bream, and crappie. Gizzard shad were successful in reaching the waters of the lake before the gates of the dam were shut and it is possible that this forage fish will supply the necessary food for the game fish. The beaver ponds had some large fish but now with the expanse of water, the lake probably will need a couple of years before consistent catches of large fish can be expected.

In 1964, the lake was approximately half full and ducks, both divers and puddle, thrived in the abundant food and cover. I saw diving ducks for the first time in that area. Until then canvasbacks, redheads and ringnecks were very rare around Roxboro. My duck hunting experience had covered only puddle ducks like the mallard, black duck and wood duck that frequent shallow ponds and rivers. This year due to high water and diminishing cover, most puddlers left for more suitable environments.



A 400-foot chimney towers over the steam generating plant on Hyco Lake.

Small bass up to 10 inches are plentiful and Hyco should prove to be an outstanding bass and panfish lake in the future. Crappie over a pound have been caught, but the large ones are not plentiful. The large ones probably came from one of the beaver ponds. The lake has five feeder streams that will serve to keep a continuous flow of fresh water, they are South Hyco, Cobbs, North Hyco, Double and Richland creeks. There are several access roads to the lake. Dirt roads Numbers 1343 and 1300 were partly flooded by the water, also parts of old highway Number 57 is under water and makes for an excellent launching ramp. Boat launching is $2. daily or $10. annually.



THE Coast Guard Auxiliary reports that participation in their annual statewide courtesy motorboat examination day (CME) increased over last year. Ten Auxiliary Flotillas took part during the April 30 event. Examination stations were set up in over a dozen locations throughout the state.

A total of 683 boats passed through the stations. However, only 269 were awarded decals. You may recall that in order for a boat to pass the Auxiliary exam, it must have aboard equipment *in addition* to that required by law. Many boats fell short in this respect. Harry Gross, an Auxiliary official, put it this way, "It just doesn't make sense for a person to spend two or three thousand dollars for a nice, modern boat and fail to spend the relatively few more dollars for adequate equipment to protect his investment, as well as his own and his family's lives. But this is happening in many cases." We agree.

Here are some of the items that prevented 60 percent of those inspected on April 30 from receiving a decal: lack of basic equipment, such as anchor and line, pump or bailer, paddle or oar, sound-producing device, fire extinguishers, (with many discharged or empty), unserviceable equipment, bilges caked with grease, rotten wood in bilge, and grease-caked gas cans.

Numbering discrepancies in general and loss of one or more numbers was a leading failure.

Seaworthy?

The list of ocean crossings in small boats is longer than one might suspect. Perhaps you have read of such accounts. In recent years we recall the twin outboard 18-footer that crossed the North Atlantic safely. As I recall, additional fuel was received from ocean-going ships. Then there was the professor who crossed the Atlantic in a sailing kayak. Of course there are stories of rafts, small sailboats and even rowboats, too. Rowboats, yes, and another such story is in the making according to the following report from Local Notice to Mariners:

Special Notice

Atlantic Ocean. A non-powered 15-foot rowing boat named "Puffin" departed Chesapeake Bay on 21 May, 1966 with two persons on board. Intended course is easterly to the Gulf Stream, thence to intercept Track Bravo of the North Atlantic Lanes, thence on a great circle course to England.

Shipping is requested to be on lookout and report sightings of the "Puffin" to the following cable address which will accept collect messages: "The People London WC2".

The "Puffin" is a 15-foot decked-over rowboat, slim rudder on stern, five foot radar mast on bow, orange hull and deck, grey cockpit, and will display a quick flashing white light during periods of darkness.

The craft is equipped with two-way radio of one-watt power operating on 2182 kc/s and Gibson Girl transmitter operating on 500 kc/s.

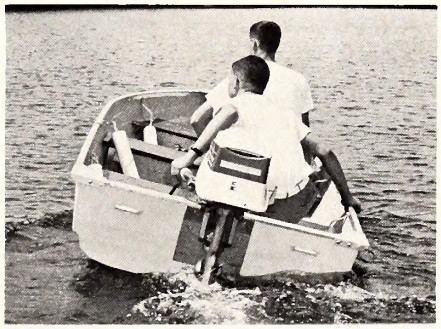
Did he or will he make it? We don't know. This is not to suggest that you try it. I just thought that you would be interested in this bit of boating news.

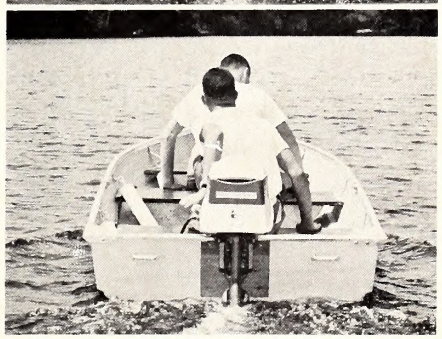
There is perhaps a moral. Perhaps we can conclude that man in his small boat can survive the bad days and enjoy every minute of the good ones *If* he is prepared. Think of the dozens of people who are involved in fatal boating accidents each year in farm ponds; the boats are often larger than kayaks.

Regulation Change

A recent change in the motorboat registering regulations permits a boat operator who is for the first time mounting an "over ten horsepower" motor on his boat to use the bill of sale as a temporary (20 days) certificate of number.

In order to be used as a valid temporary certificate of number, the bill of sale must carry full name and address of the dealer, full name and address of motor buyer, a brief description of vessell to which motor is attached, previous registration number of vessel, if any (if none, so state), make and model of motor, date of purchase, date of application for regular certificate of number and a statement subscribed and sworn to by both dealer and buyer before a notary public that the information given in the bill of sale is true and accurate. This regulation change will allow one to use his boat a few days sooner. Registration should be applied for in the usual manner at the time you purchase the larger motor. The dealer will usually have application blanks.





Proper loading of passengers and equipment should be taken care of before shoving off. If the boat in the top photo (loaded as it is), were to hit a floating object or run into choppy water there is considerable chance of capsizing. Besides looking just plain foolish, these skippers have reduced stability, maneuverability and motor efficiency. In the bottom photo, the boat is travelling on even keel due to a shift in loading. The operator has also taken his hand off the gunnel, a good place for a serious injury.

The Kingfisher He's Different!

by Lunette Barber
Illustration by John Taylor

WHAT a creature! It is necessary and customary for the kingfisher to fish, and that he does over most of the world, chiefly in the eastern hemisphere. Of the 7 species, six inhabit our hemisphere, but only two of these breed north of the Rio Grande. The green kingfisher ranges from southern Arizona and southern Texas, south to central South America.

It is, of course, the belted kingfisher that we observe here in North Carolina. His range is amazing—from Alaska to the West Indies. In North Carolina they appear throughout the entire state in summer, but are less numerous in the mountains in winter, although winter records have been added in Watauga, Yancey, Buncombe, and Swain counties.

Their name implies their food—fish chiefly. With no fine fishing tackle of which to make conversation as the mammal, man, does and no fine tackle box containing "a little bit of everything", the kingfisher catches fish in brooks, ponds, rivers, lakes, or along seacoasts with his permanent tackle — a long, strong spear-like bill. When fishing is bad because of rough water or other reasons, they will catch crawfish, frogs, beetles, locusts, and even eat wild fruit. Night fishing is not too unusual.

What a fisherman! With excellent vision, they may hover over water and often dive through the air 50 feet for a fish dinner. Fishermen are sometimes displeased with his competition, but predation is important in nature. If a fish is not healthy and strong enough to escape the bill of a bird, perhaps it is just as well that he is gulped up for a bird's dinner.

In the bird world, the male has been given credit for being the prettier; but the female kingfisher is more colorful—her brown flanks and breastband make the most difference (see cover). The male's upper parts and belt are bluish-grey with white under parts. The crest is also a good identification feature. The feet are small and legs are short.

Perhaps the female needs no protective coloring since the nest is concealed in a very unusual manner. At the end of a four—or five foot long excavated burrow in a bank near water (most of the time) is a chamber about four inches in diameter which serves as the nest. The entrance to the burrow is quite small—three or four inches in diameter. In this chamber are laid from five to eight white, almost round, eggs. Parents share in the task of incubation during the 23 or 24-day period. The young leave the nest after about four weeks.

The parents compel the young to learn to fish. A fish is stunned or killed and allowed to float so that the young may have a practice target and menu too. From then on they go out into the world to meet their friends and foes.

This unusual, amazing bird is much to be admired. For a greater appreciation of this feathered fisherman, check the many, many interesting references and illustrations in your library.

Range of the belted kingfisher (both eastern and western) is shown here.

Women, Wildlife, and the Green Stuff

by Bryant Chaplin

Reprinted from *Massachusetts Wildlife*

TODAY'S typical hunter or angler is no longer the hairy-chested, hard-drinking, unwashed and unshaven psuedo-woodsman that used to be the popular (though inaccurate) image held of those who go afield. He's more apt to be washed, pressed, sober and clean-shaven—and in the company of his family complete with wife and kids. Hunting and fishing have become family activities, for a surprising number of the gentle sex have taken up these sports and insist on going along with their husbands.

A study by the federal government found that 20 million households in the United States contained at least one hunter or fisherman, or both. And, the same study found that one out of every ten women in the country is an active angler, and one out of every 69 ladies an equally active hunter. Since this study is five years old, and those of us who go afield are finding more and better looking hunters and lady anglers in the woods and waters each season, it's safe to say that the number of wives and gal friends taking over the "man's sport" is on the increase.

It's said that women really control this country. They mastermind family expenses, at any rate, and that's the basis of the intangible known as the "national economy." It's also a well established fact that an irate group of ladies, descending on a legislative hearing, or devoting themselves to any worthy cause, can get more accomplised in a shorter time than all the manpower that can be mustered.

Women's organizations in this country have long been the backbone of social progress. Let's face it, men; it's the women who run the PTA, and therefore to some extent, education in the United States. It was the ladies who took away our booze in the '20's, and then helped us get it back when their good intentions backfired. It's the ladies who raise our kids, wipe their noses, fill their stomachs, and motherly shepherd them through the formative years.

And while strong, rugged individualistic mountainmen may have opened up this country by skinning beavers and Indians, the place didn't amount to much until the women arrived, took over and made homes.

It's a fact—women build the world; it's the men who mess it up.

Now the ladyfolk of the land are aroused again. This time they're concerned with saving some of the land they've built. In the forefront in every fight to preserve natural beauty, to protect diminishing wildlife habitat, to clean up polluted streams, to wisely manage our natural resources, are the organized women's clubs, the garden clubs, sportswomen, and ladies organized, unorganized, and disorganized.

Surprising numbers of them are turning out to be interested in saving the outdoors,—and not a few of them are taking up hunting and fishing!

I wonder how many of them are aware of the great contributions they've already made to wildlife conservation? In addition to their own license fees, no mean amount, and the cost of equipment they use, they also (let's face facts, men) control what you and I spend. How many fancy new deer rifles have *you* bought without consulting the Mrs.?

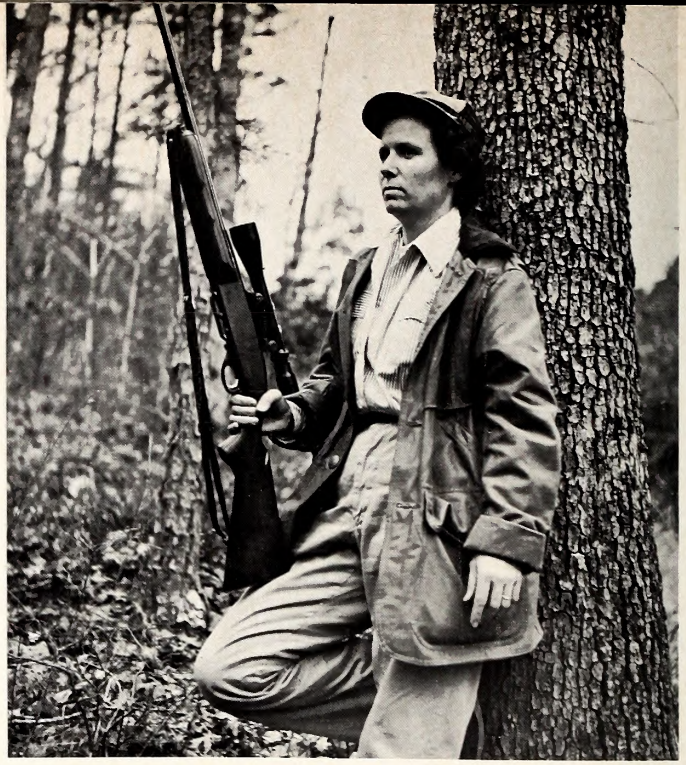
Purchases of hunting and fishing equipment and services required by hunters and fishermen amount to better than four billion dollars a year in the United States.

Three million dollars a year are spent in this country just to purchase a federal stamp which permits you to go duck hunting, if you also have a state license.

Almost 22 million dollars a year is collected in federal excise taxes on firearms, ammunition and fishing tackle.

More than 132 million dollars a year is spent for state fishing and hunting licenses. This figure has grown; last year it was a little over six million less.

How does all this money help wildlife conservation? It's practically the only source of sizeable financing of wildlife programs the country over! The duck stamp money is used to purchase federal waterfowl refuges. The federal excise taxes are allocated to the states for wildlife programs and are practically the sole support of vital research and most of the acquisition and management of wildlife land and water areas. The hunting and fish-



If you think hunting and fishing are strictly male sports, look again. Interest in the out-of-doors is quite high among the women folk. Keep it up, Gals!

ing license money is the major source of operating revenue for every state fish and game department in the United States. (Latest figures available for North Carolina show that license funds made up $2,445,168 of a total annual revenue to the Wildlife Commission of $3,332,555!—Ed.)

Add all this to the smaller, though worthy, financial contributions made by such groups as Ducks Unlimited, the National Wildlife Federation, Audubon societies, garden clubs, and others, all of whom have thousands of women and sportsmen members, and it's just plain that the lifeblood of wildlife conservation is dependent on those who hunt and fish or otherwise have an interest in wildlife. It's also plain that a very big percentage of them are women!

Perhaps some of the ladies who dislike hunting or guns might wonder what would happen to wildlife conservation if there wasn't a reason, or it weren't possible, for American sportsmen and sportswomen to buy guns, ammunition, tackle and licenses.

DON'T TAME TURKEY

• **continued from page 13**

ulation, under the laws of natural selection and "survival of the fittest," will eventually adjust itself to the living conditions of the area, becoming more and more like the "native" race. In other words, the hereditary traits of domestic turkeys will be eliminated due to selection for hereditary wild traits. This condition will exist *only* if the released stock contains enough hereditary characteristics of the wild turkey to enable it to survive the transition period.

Other than disease, few hazards are involved when game farm birds are released *in heavily hunted areas* just prior to the hunting season. The individual turkeys capable of surviving the gun, predators, the snows and other perils of winter, and that succeed in reproduction the following spring, are of sufficient quality to be worthy of a place in the environment. Also, the fact that a portion of the birds thus released are harvested by hunting, means that there is a definite return to the persons bearing the cost. There are many who would consider this arrangement a poor substitute for hunting under natural conditions.

It is the firm opinion of the authors that states having either potential turkey range or native wild turkeys should enact legislation that would prevent any individual or organization from allowing domestic turkeys to come unduly in contact with wild birds, or from releasing any turkey in the wild, except under permit rigidly controlled by the Game Department. In the profession of law there is a saying, "He who would serve as his own lawyer has a fool for a client." In the medical profession only properly trained physicians make top medical decisions and formulate medical policies. In some states top decisions and policies affecting wildlife are made by laymen or others outside their fields of training and knowledge.

The whole art and science of successful wild turkey management rests on two huge pillars of confidence: (1) good, wild stock and (2) adequate range of high quality. When either pillar is unstable or inferior, the unexcelled sport of turkey hunting, as we and our ancestors have known it, is surely imperiled.

Releasing game farm stock is unintelligent tampering with a superb product of millions of years of evolution—the native wild turkey. In this case, "foreign aid" is definitely harmful. Don't tame that turkey! ◆

DEPARTMENT OF LETTERS TO THE EDITORS, FIELD NOTES, AND ITEMS OF INTEREST

Conducted By Rod Amundson

Uncle's Man Grab

Not long ago we walked into the office of an old friend in a midwestern conservation department.

"Come on in," he said. "Want a job?"

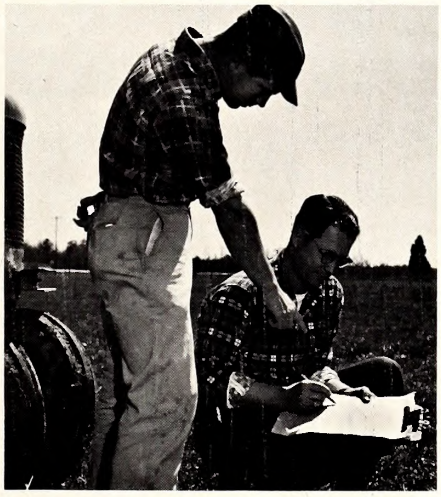
It turned out that he needed both fishery and game biologists (and he must have needed them badly), for his department had recently lost some of its best men to federal agencies who value trained conservationists more than the states do.

The states are often the training grounds for key men who "graduate" to federal jobs and excellent civil service ratings. Few states pay conservation officers, game managers, biologists or administrators salaries that the Government can't easily top. Federal civil service also has top-notch retirement, pension, vacation and sick leave provisions, and relative freedom from the petty political flak that has driven many a harassed state man to seek refuge under the sheltering wing of the eagle.

The U.S. Fish and Wildlife Service, and its Bureau of Sport Fisheries and Wildlife, hires many of the best conservationists. Also getting their share of good men are the Corps of Army Engineers, Bureau of Land Management, Bureau of Outdoor Recreation, Soil Conservation Service, Forest Service, and National Park Service. All of these agencies have long-range conservation and resource management plans, and are willing to pay for the men that those plans need.

For all practical purposes, these men are lost from state fish and game work and from some of the most basic and important jobs in wildlife conservation. A state game chief recently complained: "We have lost five biologists in the past few years. Good men? Of course they were—that's why we lost them. But what bothers me the most is that they are no longer doing real field work. Each of these experienced field biologists is now in some desk job, part of 'long-range' programs."

This doesn't mean that the feds aren't doing a good conservation job. They just aren't doing the same job that the states are doing. The federal responsibility for game species is generally restricted to migratory birds, and to wildlife in national parks and refuges. State conservation agencies are in charge of almost everything else—from rabbits to bull elk. The nation's wildlife conservation does not emanate from Washington, D. C., but from the bootsoles of state field men.



Are state conservation agencies "training grounds" for federal biologists? States need them, too, Uncle!

The states do benefit from the trained conservationists on federal payrolls. Everyone does, for they are good men. But it isn't the same as having state men working on state problems under state programs. No federal conservation effort can quite fill the vacuum left by the loss of a state game manager, warden, or administrator. It takes good men to plan good programs and guide them to completion—and such men are being lost to some states faster than they can be replaced.

Don't blame Uncle; he must have men for the big new programs being advanced by congress and the administration. Nor is it the fault of the state agencies; they simply don't have the money to keep good men.

Blame the sportsmen who don't want to foot the bill. Unwilling to permit hikes in license fees or to support conservation's needs in their legislatures, and reluctant to pay enough to keep their best fish and game professionals, they deserve the cut-rate fish and game programs that they have chosen by default.

John Madson,
Conservation Dept.,
Olin Mathieson Chemical Corp.

Deer Problem

DEAR SIRS: I have been an ardent reader of your magazine for many years and have received many helpful ideas for the conservation of wildlife. Many of my friends have subscribed and are now enjoying the North Carolina **Wildlife.**

My friends and I also like very much to deer hunt. We have a few but would like to have more. It disturbs us very much when we hear of someone killing a doe. It disturbs us even more when we hear of people in our county and other counties who kill deer to keep them from destroying their crops. The part we dislike most is that the deer are wasted. The deer are killed and left in the field for the buzzards to eat. I know this is legal and do not condemn the farmer for saving his crops any way he can.

We would like to try to move some deer in thickly populated areas to other areas which do not have many.

I don't know much about tranquilizers or the use of them, but I was wondering if it would be possible to move the deer from one place to another by using tranquilizers. FLETCHER McCOY, COVE CITY

Some work has been done in North Carolina along the line of

KNOW YOUR PROTECTOR

Foster Forbes, Jr.

Foster Forbes, Jr., stationed at Manteo in Dare County, was born November 13, 1922, in Currituck County. He is the son of Mrs. Foster Forbes, Sr. of Mamie, North Carolina, and the late Mr. Foster Forbes, Sr. Forbes graduated from Griggs High School at Poplar Branch, North Carolina. Prior to his employment with the Wildlife Resources Commission Mr. Forbes served three years in the U. S. Coast Guard, also three years in the Merchant Marines and was self-employed as a farmer in Currituck County.

Forbes completed the Pre-Service Training School for Wildlife Protectors at the Institute of Government at Chapel Hill in June, 1960, and was employed on July 1, 1960, as a Wildlife Protector in Dare County. Since his initial employment he has completed five In-Service Training Schools. Mr. Forbes is a member of the Southeastern Association of Game and Fish Commissioners Law Enforcement Section, the Dare County Peace Officer's Association, and the National Rifle Association.

Mr. Forbes was married to the late Jacqueline Tillet of Kitty Hawk, North Carolina, and they had one son, Foster Allen, age five. Mr. Forbes is a member of the Powell's Point Christian Church at Harbinger, where he and his son attend.

DIVISION ENFORCEMENT RECORD FOR MAY, 1966

HUNTING & FISHING	
Persons checked	43,651
Total prosecutions	992
Total convictions	964
Total cases not guilty	13
Total cases nol prossed	12
Total fines collected	$2,857.15
Total costs collected	$8,473.85
BOATING	
Persons checked	8,730
Total prosecutions	195
Total convictions	191
Total cases not guilty	2
Total cases nol prossed	2
Total fines collected	$ 638.70
Total costs collected	$1,743.45

All fines and any arrest or witness fees are paid into the school funds of the counties in which the violations occurred, and no part of the fines or costs collected are paid to the North Carolina Wildlife Resources Commission or its personnel.

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using tranquilizers on deer, but thus far a practical and economical system of doing this on a significant scale has not been developed. The same applies to live trapping.—Ed.

DEAR SIRS: Last week, when the robins were coming through here, we saw something we have never seen before. It was actually my father who spotted it first. Right outside our window, with the rest of the robins was what looked like an albinic robin. Its breast was a very light orange in color and the rest of it was an off-white, right down to the feet. Even its beak was very pale in color.

We all saw it, so it wasn't just a ghost, though that is what it looked like. I tried to take a picture of it but it flew. We didn't see it again. It might not have been an albino but we don't have any pure white birds in this area. Please tell us what your opinion of the whole affair is. We've never heard of one though I suppose this one isn't the first.

Thank you for your consideration. MISS MARY SUE FISHER, CANDLER

There are varying degrees of albinism.—Ed.

Lost In The Cypress Swamp

Darkness fell earlier than I expected in the cypress swamp. The trail leading home was obscured by the green spring foliage. Familiar trees, hidden by blackness, could no longer be found by my searching eyes.

Wildlife, that roam the swamp at night, began their movements in the underbush. An owl began his mournful cries for the moon, as the bullfrogs croaked their mating calls. Fighting the underbrush that hung like a death veil all around me, I moved in an uncertain direction toward the creek.

My thoughts turned to the many tales of people who became lost in this moccasin heaven. As all hope left my mind, I heard the cry of the kingfisher as he flew homeward down the creek run. I fought the underbrush with new energy, and soon found the creek. Moving along the creek bank, I soon came upon a familiar logging road. Turning back and looking toward the swamp, I gave a salute to my feathered friend.

S. N. Ashley, Jr., Salemburg.

Shocking!

DEAR SIRS: Re—the letter from Mr. Mabrey Bass, Jr., of Tarboro, I believe I have the answer to the pigeon problem.

While taking snapshots from inside the Capitol dome at Washington, D. C. last summer, I noticed a tiny wire, about the size of a six-pound test line, resting on insulators about an inch high, and spaced about three feet apart.

An officer told me that there were fifteen miles of wire on the Capitol alone, and that most other buildings were similarly equipped. When I asked if this wasn't an expensive way to rid the buildings of pigeons and other birds, he said that it was not since the four volts that the wire carried kept the building clean, and reduced the labor force by twenty men, who were needed to keep the droppings scrubbed from the area, especially the steps.

The wires and insulators cannot be seen from the streets, so do not detract from the beauty of the buildings.

I hope this information will be of help to all who might have similar problems. FRED WALDEN, LINCOLNTON

Long Distance

This letter came to us via Lidseen of North Carolina, Hayesville. You may be interested to know that WILDLIFE goes to every state in the union, plus many foreign countries including

Soviet Russia. Farthest is New Zealand.—Ed.

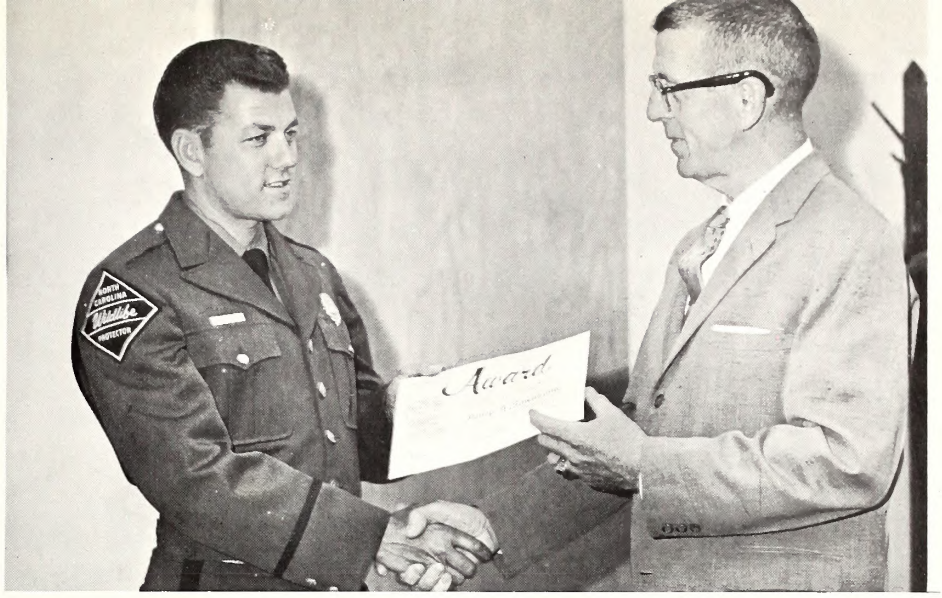
DEAR SIRS: Thank you so very much for sending us the subscription to WILDLIFE. We wanted to write and thank you for the one last year but your name was in hand-writing and we couldn't figure it out. (Like *our* handwriting) We like the magazine so much and are so happy you sent us a renewal. We do not hunt or fish but the articles are so vivid and interesting, the ones on animals, snakes, etc., really fascinating. It makes us want to go to North Carolina. Frank, my husband, went to school in Asheville and has always had a love for the state.

Mitchell's family also enjoy your subscription, especially Charley who is a fishing addict and thinks of nothing else. I hope he has written you as he told me he was going to the last time we were in California, but I am afraid he is poor letter writer. For him there is nothing but fish, fish, fish.

If you ever come to Mexico and Guadalajara, we hope you will let us know so we can see you, and show you some of the city and envirous.

We have just sold our first book, PEPE THE BAD ONE to Westminster Press. In it we have used many things as we know the Mexican people so well from working many years in the free clinic for the poor down here.

Again we are most grateful.
Regards,
Agnes J. Dazey, Zapopan, J al.
Mexico



Henry A. Townsend receives the N. C. Protector of the Year Award from Wildlife Commission Director Clyde Patton. This citation for outstanding service was awarded by the Law Enforcement Section of the Southeastern Association of Game and Fish Commissioners at its annual meeting in Oklahoma last fall.

Scarneck Wants to Be Alone:

Even an exclusive society that boasts only 44 members can have a character that wants to be alone, according to the Wildlife Management Institute. Such is the case with the rare whooping cranes, all but one of which have left their winter home on Texas' gulf coast for family duties in Canada's Northwest Territories. Still frolicking in the sunny south is Scarneck, an anti-social whooper whose name comes from his distinctively arranged neck feathers.

The migratory urges of the go-it-alone whooper clearly are out of phase with those of his kind. Scarneck is the last to leave Texas in the spring and the first to arrive in the fall. He doesn't go for hellos or goodbyes, and spends much of his time on Matagorda Island apart from other cranes on the Aransas National Wildlife Refuge.

Most whooping cranes left the Aransas refuge in two unusual flights this year. On April 6, 25 departed, including one group of 20, the largest single mass movement of whoopers ever recorded. Fifteen others trickled out in smaller groups on April 11, leaving Scarneck to hold the fort.

Whooping cranes are at their greatest abundance since record keeping began in 1938. There now are 44 known wild flying birds, including eight young. Another six are in captivity at zoos and one is at the Department of the Interior's Patuxent Wildlife Research Center in Maryland.

Evidently the cooperative protective and educational programs of the U. S. and Canadian governments, plus the efforts of the states, sportsmen, conservation and other groups are yielding dividends in the form of more whoopers. Although the birds may stand at the threshold of life's door, their outlook is the brightest in years. But Scarneck apparently doesn't care.

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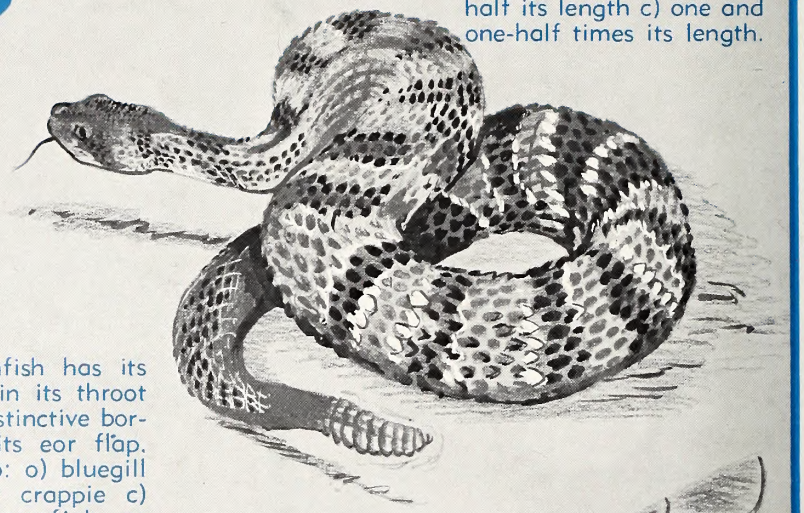
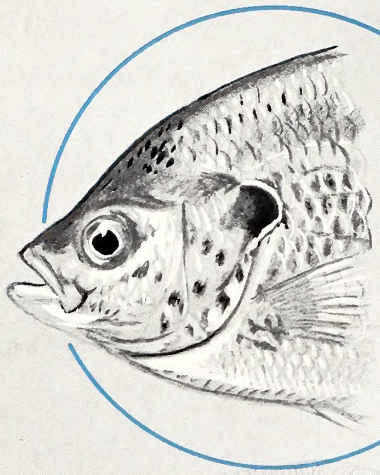
Wildlife QUIZ

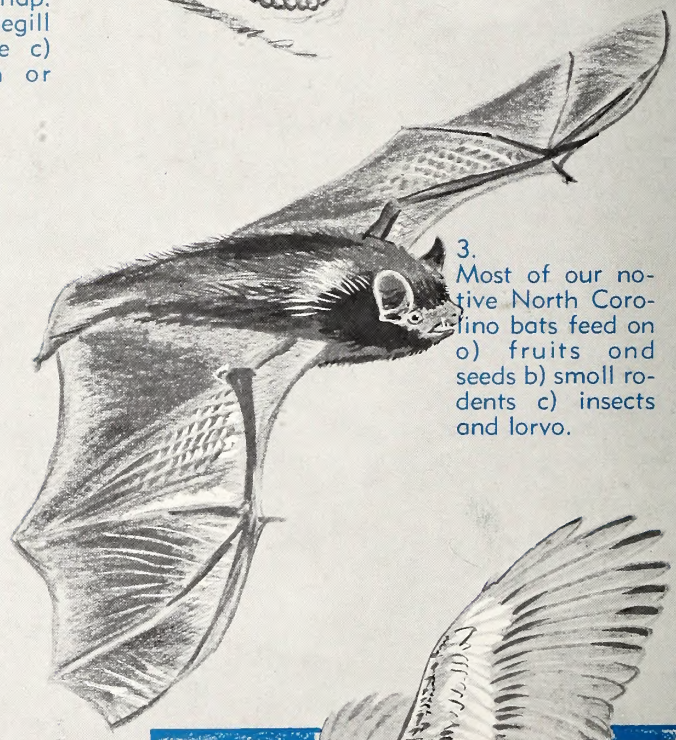
What's your Wildlife I.Q.? In case you want to check, the answers are below.

1. From o coiled position, o rattlesnake can strike o) one-third its length b) one-half its length c) one and one-half times its length.





2. This sunfish has its "teeth" in its throot and o distinctive border on its eor flap. This is o: o) bluegill b) white crappie c) redear sunfish or shellcracker.



3. Most of our native North Corolino bats feed on o) fruits ond seeds b) smoll rodents c) insects and lorvo.

4. Will the real wild turkey pleose stand up? The breost feather on the **right** (buff-colored tip) or **left** (white tip) is from wild bird.

5. Tarheel hunters took on estimoted a) 500,000 b) 2,000,000 c) over 3,000,000 cottontails during the 1964-65 season.

7. Most bobwhite quail don't reach their third birthdoy, TRUE FALSE?

6. A full-grown North Corolino block beor usuolly weighs about a) 600 pounds b) 125 pounds c) 250 pounds.

D. RAVER

ANSWERS: 1. b. 2. c. 3. c. 4. right 5. c. 6. c. 7. True

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Wildlife IN NORTH CAROLINA

SEPTEMBER, 1966

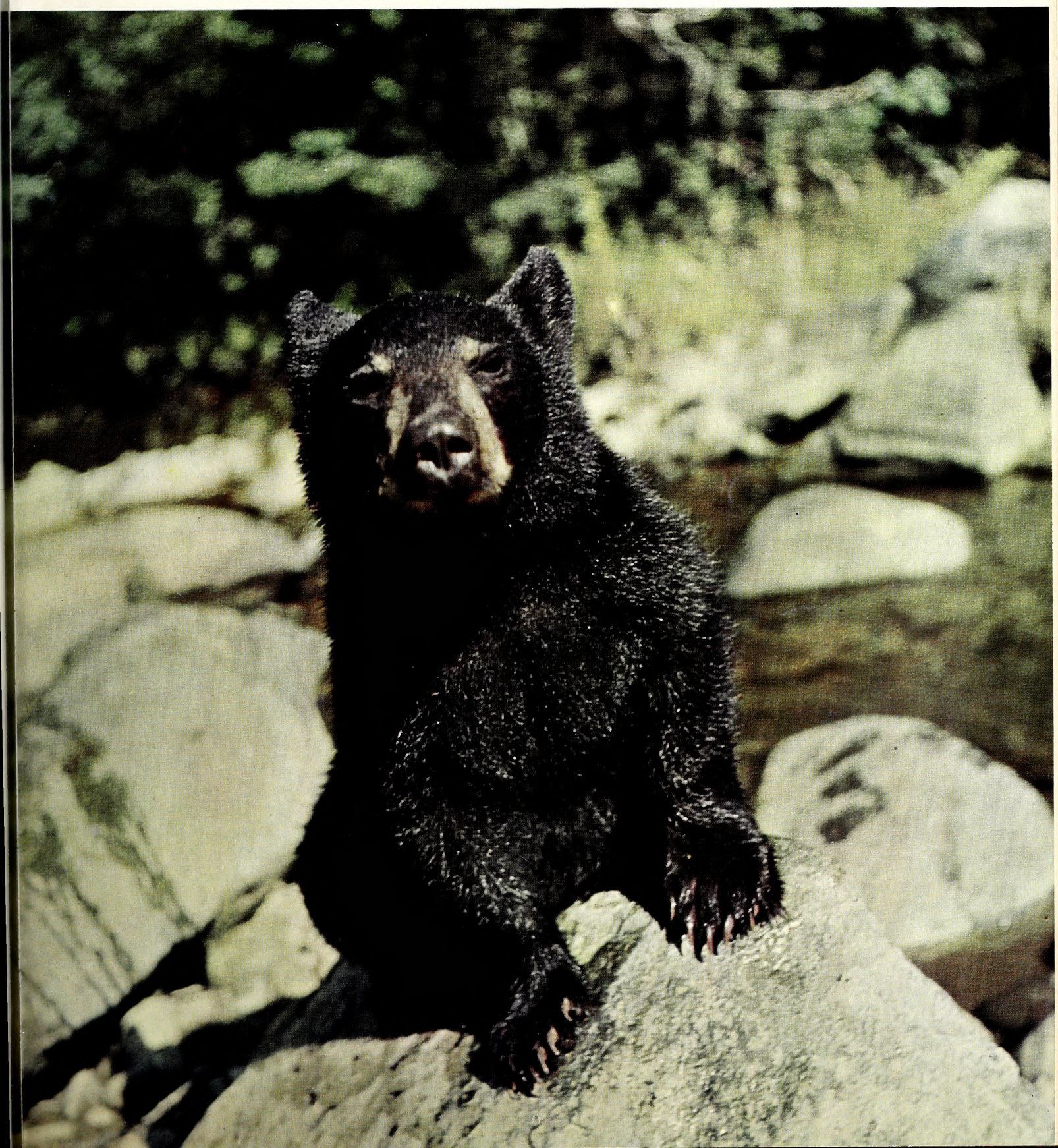

PHOTO BY JACK DERMID

Nice Kitty(?)

Nature is beautiful, kind, gentle, but also cruel at times. The bobcat is a predator and makes its living at the expense of others. The squirrels, rabbits, mice and rats on which it feeds, know it as a relentless pursuer. Rarely does the bobcat damage healthy game populations.

STATE OF NORTH CAROLINA

DAN K. MOORE
GOVERNOR

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WILDLIFE IN NORTH CAROLINA recognizes the need for close cooperation between State and Federal conservation agencies and the people who hunt and fish—to bring about a restoration of our renewable resources. The Editor gratefully receives for publication news items, articles, and photographs dealing with the North Carolina out-of-doors, but reserves the right to reject materials submitted. Full credit is given for all materials published.

* * *

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SEPTEMBER, 1966 VOL. XXX, NO. 9

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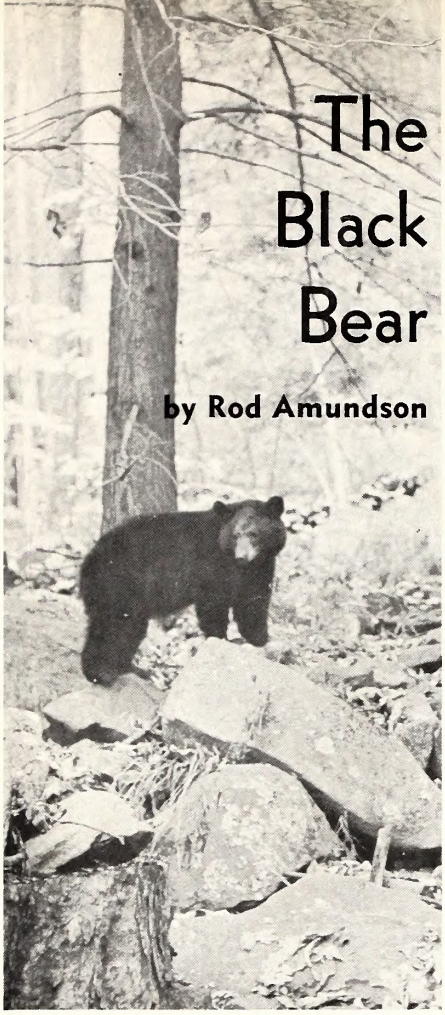
JOHN PARKER - - - - - OUTDOOR SAFETY
TOM JACKSON - - WRITER-PHOTOGRAPHER

The moments of relaxation for wildlife are relatively few and short. This drowsy cub has just emerged from the trout stream in the background and is now sunning himself in the early fall sunshine. Next year at this time he will be wiser in the ways of man and fearful of his scent. For additional information on the bear family, see the story on page 4. Photograph by Jack Dermid.



The Black Bear

by Rod Amundson

BEARS roamed the North American continent long before human beings migrated in from Asia, and since the first appearance of men in the New World there has been a constant struggle between mankind and bears. With minor exceptions bears have been the losers. In early days bears were found throughout the United States, but at present fourteen states do not have any bears at all. They were once extremely abundant along the Atlantic states, but have disappeared from Connecticut, Massachusetts, Delaware, New Jersey, and Rhode Island, with the exception of a few specimens in zoos and itinerant sideshows.

Altogether, there are probably not more than 200,000 black bears in the entire country, a small population indeed compared with more than two million deer. According to census estimates, North Carolina probably does not have more than 5,000. The constant warfare between men and bears has resulted in the decimation of bear populations, but many states have placed bears on the protected list of big game animals to keep them from becoming extinct. This is particularly true in North Carolina, although provisions are made in the regulations whereby bears may be killed at any time of the year when such action is necessary to the protection of property. Such a concession to landowners in the eastern part of the state is particularly necessary where bears frequently become destructive.

Description

It is no more necessary to give a detailed description of a black bear to a North Carolinian than it is to describe the taste of black-eyed peas or collards. It might be worthwhile, however, to point out certain differences between the black bear and other species of bears found in this country. The black bear is the smallest of American bears, seldom attaining a length greater than five feet or a weight in excess of 500 pounds. North Carolina has produced a number of large specimens, particularly in the Smoky Mountains where 600-pounders have been taken, although the average weight is around 250 pounds.

There are a number of color variations in the black bear tribe, ranging from black to brown, to gray or gray-blue. The North Carolina bears, however, are consistently black in color, and may be decorated with a small white patch of hair on the chest. Old specimens may become grizzled about the flanks and muzzle, but there are no records of any marked color variations.

Behavior

Black bears are essentially solitary animals. Only rarely are several seen together, and groups of bears usually consist of a mother and her cubs. There was an interesting occurrence in North Carolina of bears literally flocking together. William Hammett, then project leader of the Wildlife Resources Commission's state-wide game inventory, describes the occurence thus:

"There happened to be a mast failure in the fall and winter of 1946 in the western part of the state, and the bears had to come down out of the mountains to seek food in the valleys. This resulted in concentrations of bears in fields and orchards. Local residents were convinced that bears had suddenly become numerous, and a heavy kill of bears took place. Fortunately, there was a good crop of mast the following year, and the bears were able to remain in their regular habitat, and thus did not become exterminated.

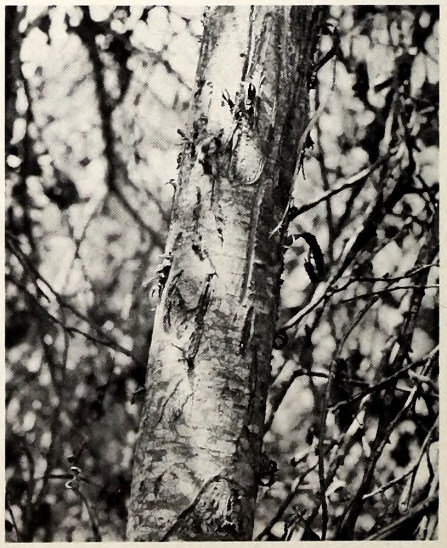
"During the migration of bears to the valleys, however, as many as 17 to 25 were slaughtered in the vicinity of small mountain apple orchards."

Bears are a hibernating species, but there is no record of true hibernation in North Carolina, and black bears have been observed active through the entire year. The shambling gait of black bears gives them the appearance of awkwardness, but the appearance is deceptive indeed. They are extremely swift runners, and can handle themselves skillfully at tree climbing.

Although definitely non-social animals, black bears seem to have some regard for the presence of other members of the species. An interesting phenomenon sometimes referred to as "tree barking" takes place in bear ha-

A black bear has left his autograph in the form of claw marks on this apple tree. Only he's sure why he did it.

PHOTOS BY JACK DERMID



bitat. Woodsmen have found smooth-bark trees scored with a series of claw scars which indicate the bears have a habit of standing on their hind legs and marking trees as far up on the trunk as their front legs will reach. Many people believe that individual bears measure their growth by the distance their claw marks reach up the trunk of the tree. Others suggest that the tree trunk clawing activity is carried on by male bears who display their growth and physical development by clawing the bark to the extent of their reach and challenge other males to equal or exceed their accomplishment.

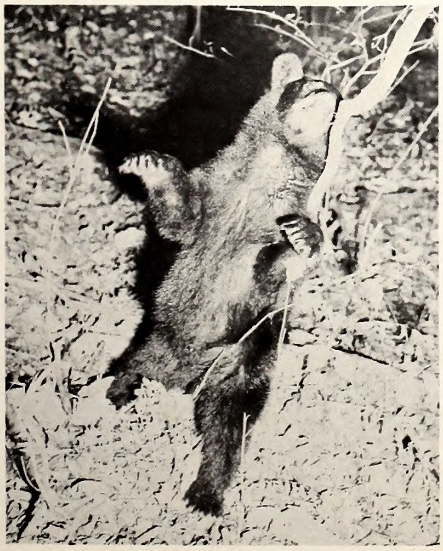
Ordinarily, black bears are shy, inoffensive animals, but when wounded or brought to bay by dogs, they are among the most ferocious fighters. Females with cubs become pugnacious, and may attack intruders without hesitation.

The eyesight of the black bear is poor, but this handicap is compensated for by very acute senses of smell and hearing. Hunters who take bears by stalking invariably work upwind as quietly as possible. A snapping twig or the brush of branches and leaves against hunting clothes are sufficient to send the quarry off on a mad race for security.

Breeding Habits

According to Seton, black bears are not born until the mother reaches her fourth birthday. The gestation period is about seven months. In northern climates, the cubs are born during hibernation. North Carolina cubs are usually born in late winter in rhododendron slicks, mountain caves, or other places inaccessible to intruders. The young are born blind, helpless, and almost hairless. Where hibernation occurs, they alternately sleep and suckle during the remainder of the mother's hibernation period. In North Carolina the cubs are born during the relatively inactive period corresponding to, but not identical with, hibernation. The mother and cubs may remain in the nest for several weeks until the young are old enough and strong enough to follow their parent about the woods.

The flash camera caught this cub in a characteristic rubbing position, using a handy sapling as a scratcher. Ahhh!



Other than to sire the young, male bears have little or nothing to do with their progeny. A single male may father several litters of cubs in a given range and remain oblivious of their existence.

Cubs usually come in pairs, although three are common and four unusual. They weigh about half a pound at birth, less than the weight of a newborn porcupine. As they grow and develop, they become extremely playful and "cute." As a result of these characteristics, cubs frequently are taken away from their mothers, often at the cost of the mother's life, and kept as pets by well-meaning but misguided persons. Such activity, in North Carolina, is strictly illegal, and persons caught with cubs in their possession are prosecuted for unlawful possession of game animals.

Although cubs become affectionate and playful pets, they frequently become dangerous on reaching maturity. Their unlawful owners are then faced with the problem of disposal. Frequently the cubs are turned over to such zoos as have need for them, or, far worse, are sold to a roadside purveyor of gasoline and barbecue to spend the rest of their days in pathetic captivity to lure cash customers into their owner's business establishment. It is difficult to understand how intelligent human beings can witness the spectacle of a mangy, bedraggled, broken-spirited bear in a roadside cage without feeling an irresistible urge to set the pathetic captive free. No matter how well fed and cared for, wild animals were intended to remain wild.

Food Habits

Like many wildlife species, the food habits of the black bear get him into a great deal of difficulty. The physical makeup of the bear, especially the dental structure, classes him as a carnivore. In practice, however, bears are omnivorous. Their food ranges from nuts, fruits, berries and grasses to livestock, carrion, and honey. They eat enormous quantities of worms, grubs, and insects of any kind. They have been known to take fish, dig up hibernating rodents, pillage mouse nests and rob birds' nests.

Several feeding habits of the black bear have caused the species a great deal of trouble. Sometimes bears stray from their preferred diet of vegetation and invade farmyards and pastures to take young livestock. Needless to say, farmers are not appreciative of such diet. Bears kill calves, lambs, and pigs by swift blows with their paws, rather than by hugging, as is so commonly believed. Ordinarily, however, bears prefer a less harmful diet, and seldom take to raiding flocks and herds unless driven by hunger, or by accident.

Bee-keepers of Eastern North Carolina have little love for black bears. Bears will endure no end of stinging by enraged bees in order to secure a belly full of honey. They wreak havoc with hives, smashing commercial hives into splinters, and committing mayhem with any type of barricade devised to protect the hives. Bee-keepers are learning to protect their hives by placing them at the top of poles high enough and strong enough to discourage the most crafty bear. Barbed wire entanglements and electrically charged fences have proven futile.

Bears are fond of green corn. So fond, that a family of bears will not only consume and destroy bushels of green corn in a single night's affray, but will then indulge in an orgy of rolling and wallowing among the rows of corn, flattening hundreds of stalks to the ground. Others are known to pick armfuls of corn and carry it into the woods. Such behavior does not give the black bear a reputable name among farmers.

Where raids on beehives and cornfields occur, especially in eastern counties, special permission is granted to farmers to track down the culprits immediately and destroy them. The struggle between men and bears still goes on, even in this modern day.

Enemies

Aside from man, the enemy of all wild creatures, bears have almost no enemies, other than inconsequential parasites and possibly disease. A full grown bear can defend himself against all comers, and mother bears do an excellent job of protecting their young.

In regions where porcupines occur, bears have met death through interfering with these quilled rodents. Bears take a swipe at a porcupine with their paw, thus getting it thoroughly impregnated with sharp quills. Maddened by the pain, the bear then bites the porcupine, with the result that he gets the roof of his mouth full of quills. This may result in death by infection or starvation.

Management

Although there is much to condemn bears, it would be tragic indeed to have them eliminated from the list of North Carolina wildlife. They do cause damage to crops, livestock, and apiaries, but such damage is not sufficient to condemn the species. Where bears commit depredations, they must be judiciously controlled. Where they are less numerous, and therefore less harmful, they must be protected. The plow, the forest fire, and the cry of "TIMBER" have done much to reduce the bear habitat. Those remaining will benefit from practical forestry and judicious harvesting of killable surpluses. Where bears commit damage to property, only the offending individuals should be hunted down and killed. Wholesale slaughter because of a few erring specimens would be a wanton waste of game animals and a tragic crime against nature.

Hunting

Men become addicted to bear hunting just as they do to fox hunting, quail shooting or horse racing. Bears are difficult animals to stalk, and skill and stamina are required of a would-be bear hunter.

Many bears in this state are killed incidentally to other big game hunting especially in eastern counties where both bears and deer are numerous. Ordinarily, however, because of their solitary habits, and their facility for being here today and in the next county tomorrow, bear hunting is a difficult process.

Bear dogs or hounds are frequently used. In some cases hounds get on the trail and follow the bear until it is treed or cornered. The hunters then close in for the kill.

In western counties, hounds are used to chase bears, but the taking of the bear is quite different from executing a cornered animal. As soon as the hounds have picked up a trail, the hunters take stands at strategic points and wait for the fleeing animal to pass by. A fast-moving bear is a difficult target even for an expert, and the bear has a sporting chance of getting away.

Two or three hundred pounds of bear can sink into the soft earth and leave a track that is almost frightening. Now it is up to this pack to find bruin out there somewhere. Watch out if they do.

Carolina Pigmy Rattlesnake

by Franklin F. Snelson, Jr.
and William Palmer
Cornell University and N. C.
State Museum of Natural History

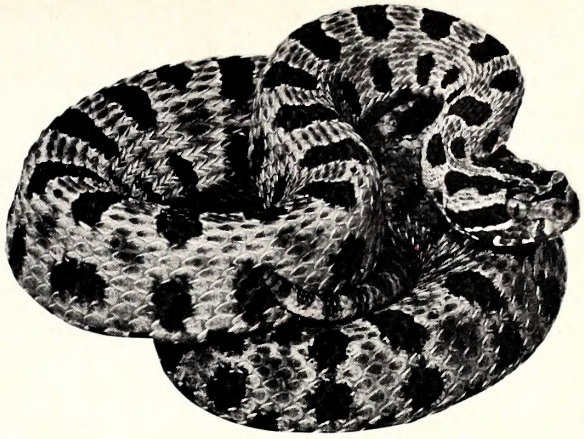


PHOTO BY
JOEL ARRINGTON

KNOWN through most of its range in North Carolina as the "Ground Rattler" (an inappropriate common name since all rattlesnakes typically are terrestrial), the Carolina Pigmy Rattlesnake, *Sistrurus miliarius miliarius,* is truly a dwarf when compared with the other eastern vipers. Nevertheless this species is a true rattlesnake and although human fatalities resulting from its bite are very rare, it should definitely be considered as potentially capable of inflicting a severe if not fatal bite.

The pigmy rattlesnake is characterized by its small size, tiny rattle, and its typical pit viper appearance: a pit situated between the eye and the nostril, and a single row of scales on the underside of the tail. Coloration of this race in North Carolina is highly variable, running the gamut from gray to brick red. The typical pattern is composed of a series of oval-shaped dark blotches down the middle of the back and a similar opposite series of smaller blotches along each side. A prominent brown or red-brown bar, bordered below by a yellowish line, extends from the eye to slightly beyond the angle of the jaw. Some individuals possess a rather conspicuous russet stripe down the center of the back. The underside is white or reddish with dark irregularly scattered markings, the most pronounced of which usually are situated along the sides of the belly. The Carolina subspecies is the smallest venomous snake in eastern North America and most adults measure around 18 inches. However, a few specimens approaching two feet have been collected from North Carolina.

Pigmy rattlesnakes range from eastern North Carolina south throughout Florida and west to east Texas. Northward the distribution extends into eastern Oklahoma, southern Missouri, and extreme south-central Tennessee. The Carolina race occurs where proper habitat exists over much of the Coastal Plain of North Carolina south of Albemarle Sound and south through most of South Carolina, central Georgia, Alabama, and possibly to the very extreme east-central portion of Mississippi.

The preferred habitat in North Carolina is represented by dry, sandy areas of pine and scrub oak, and flatwoods of longleaf pine and wiregrass in the Sandhills and southeastern portion. North of Pamlico Sound most specimens are found along slight ridges through forests of loblolly pine. These small rattlesnakes are sometimes seen crossing roads traversing such habitats during the early morning, late afternoon, and at night. Most that we have personally collected were found beneath logs, scrap tin, discarded lumber, and similar cover. Many have been taken about the vicinity of trash piles often in close proximity to rural homes.

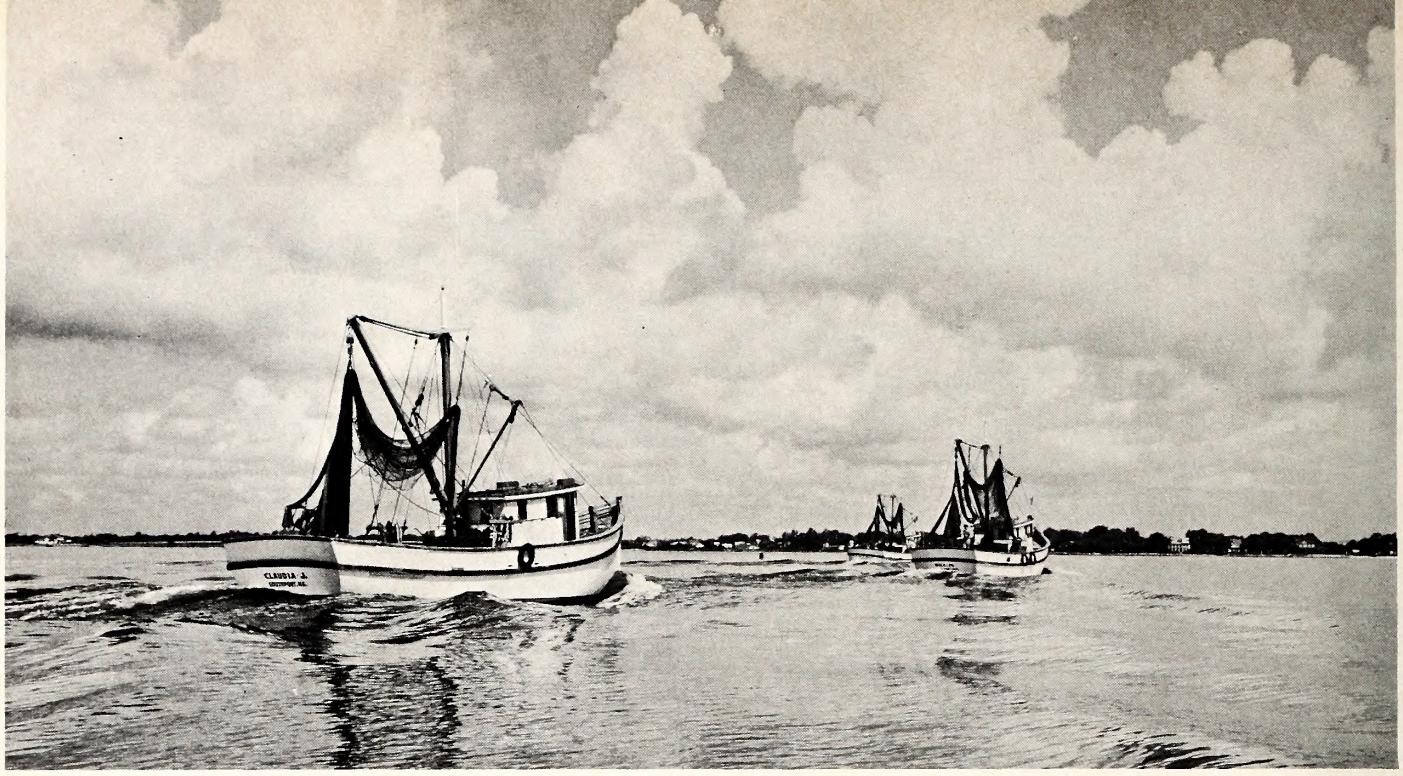
Given the opportunity, pigmy rattlesnakes will move as quickly as possible away from a human intruder. However, if stepped on, touched, or restrained with a stick these little vipers are quick to retaliate by biting the object of their annoyance. The diminutive rattle can scarcely be heard more than a few yards away, but if surprised most of these little serpents do not hesitate to set the rattle to work.

Mating occurs in the spring and up to about 12 young measuring 6-7 inches in length are born alive in August or September.

The food consists primarily of frogs, lizards, smaller snakes, very small mammals, and probably rarely small birds. Newborn specimens and juveniles appear especially fond of small frogs and lizards. As is the case with all rattlesnakes, prey usually is first bitten and killed and later consumed after struggling has ceased.

As a general rule pigmy rattlesnakes thrive in captivity at the State Museum where they usually feed readily upon small white mice. Most, however, remain very nervous (even those that have been raised from birth), rattling and assuming a defensive pose at the very slightest disturbance, and spending most of the daylight hours beneath pieces of bark placed in their cages for shelter. At the museum all dangerous snakes not on public display are kept in properly constructed locked cages in a special room and are maintained only by trained personnel.

Keeping venomous snakes in the home as "pets" cannot be too often discouraged; for newspapers as well as medical and herpetological journals often contain accounts and case histories of accidents resulting from such familiarity with venomous species. In addition, snake bite continues to be a serious problem even in zoos and museums where all possible safety precautions are followed to the letter. Unless one is prepared to suffer the consequences he had best leave the venomous snakes strictly alone.



PHOTOS BY TRAVEL AND PROMOTION DIV., DEPT. OF CONSERVATION AND DEVELOPMENT

The North Carolina Shrimp Fishery — An Economic Asset

by Edward G. McCoy and Michael McKenzie
Biologists
Div. of Commercial and Sports Fisheries
Dept. of Conservation and Development

NORTH Carolina plays an important part in the most valuable of this nation's fishery resources — shrimp. Shrimp, cousins of the crayfish, lobsters and crabs, are almost as negotiable as gold on the market, with their value continuously increasing on a world-wide scale. Within our State, shrimp rank second to menhaden in value among individual fisheries, and third in value if all edible finfish are grouped as a single resource.

The shrimp fishery on this coast began about 1880, but its actual potential was not realized until about 1923 when—for the first time in history—over a million pounds were landed.

During 1953, the North Carolina shrimp fishery reached its peak, with landings totaling over 14 million pounds. Since this record year, landings have fluctuated at a lower level, with about 5.4 million pounds (heads on) landed in 1965, yielding around $2 million to the fishermen.

There are three important commercial species of shrimp in North Carolina the brown, spotted, and white. Segregation of the catch by species indicates that the brown shrimp is the most dominant species, yielding about 50 per cent of the catch. Spotted shrimp comprise approximately 30 per cent of the catch; white shrimp yield the remainder.

Each of the three species looks very much alike and many of us, with the exception of the well-learned fishermen, have difficulty telling them apart. Brown and spotted shrimp can be distinguished from the white shrimp by the presence of grooves on either side of the head which extend along the back of the head shell; in the white shrimp these grooves do not extend more than half the length of the head shell. The brown and spotted shrimp are best distinguished by the width of the grooves along side the ridge on the sixth tail segment—in the brown shrimp this is wide open (permitting entry of a fingernail in fair-sized specimen), whereas in the spotted shrimp, it is almost closed. Another popular method of distinguishing the brown and spotted shrimp is the spot on the side of the abdomen on the spotted shrimp, from which its name derives.

Life History

These shrimp are almost the exact opposite of salmon or shad in migratory and spawning habits. The adults spawn in the ocean, and the larvae migrate to coastal sounds where they grow and reach the adult stage. With approaching maturity, the young adults return to sea and seldom, if ever, enter the coastal bays and sounds again.

Commercial shrimp, unlike crabs, and crayfish, do not carry their eggs attached to their ab-

This is the first of two articles on shrimp and shrimp research prepared by the Department of Conservation and Development's Division of Commercial and Sports Fisheries. Next month: research.

domen, but lay them directly into the water. A female can produce from 500,000 to 1,000,000 eggs in a single spawning and some females may spawn more than once. Spawning usually occurs from late March or early April to the end of September.

The eggs are spherical, about 1/75 of an inch in diameter, and sink to the bottom. Some 20-24 hours after the eggs are spawned, the young shrimp, resembling tiny mites, break the eggs and emerge. From the moment the baby shrimp hatch, they have no friends—only swarms of enemies. Arrow-worms lunge at them, copepods, jellyfishes, and the young of scores of fishes gobble them greedily. The death rate may reach as high as 80 percent in a single week. But the little shrimp have one thing in their favor—the presence of millions of millions, and even perhaps millions of billions of relatives. These small organisms (about 1/65 of an inch) are to a great extent at the mercy of prevailing currents. During the next 24-36 hours this larval shrimp undergos five molts and reach a size of approximately 1/25 of an inch. After several more molts and immature stages, the organisms end their larval phase and assume the general proportions of miniature adults. At the the end of 15 to 20 days after hatching, the young shrimp are only about 1/5 of an inch long and still a part of the plankton community.

During this period of early spring and summer development, the young shrimp have moved from the salty offshore spawning areas to the brackish inside marshes, bays and estuaries. Upon reaching these "nursery grounds" they adopt a bottom existence. Formerly plankton feeders, they now become bottom feeders, eating decayed plant and animal material, worms, crustaceans, small mollusks and mud. Growth is rapid during spring, summer and early fall, but negligible during winter.

The shrimp, like all other crustaceans, wear their skeleton on the outside, and in order to grow must cast off this shell and replace it with a new and larger one. Shrimp of different sizes grow at different rates. Unlike most fishes, the shrimp's lifetime is telescoped into a short span. Eggs spawned in February can develop into "eating size" shrimp by July. Probably most shrimp live about a year, but some may attain an age of two years.

Migration

Patterns of movements vary in different areas, but in one respect the movements are similar in all localities—after the young shrimp first make their appearance on the inland fishing grounds they gradually work their way back toward the sea. Once the shrimp have reached outside waters, their movements vary with the size of the shrimp, the locality, and the time of year.

In tagging experiments conducted by the Bureau of Commercial Fisheries, the longest southward migration was performed by a shrimp released in North Carolina in October and recaptured 95 days later off the coast of Florida—about 360 miles south of where it was released. The greatest northward migration was recorded for a specimen released in central Florida in January and recaptured 168 days later off the coast of South Carolina after it had gone about 260 miles.

Gear and Methods

Shrimp gear has not changed basically since the inception of the otter or "shrimp trawl." The history of this type gear dates back to sometime between 1912 and 1915 when the Bureau of Commercial Fisheries at Beaufort used the otter trawl in a research program. Fishermen, realizing the efficiency of this gear, quickly adopted it and by 1917, the otter or shrimp trawl was establishd.

Trawls now in use vary in size from the 10-foot "try net", used for locating schools of shrimp, to the vessels' main trawl which may have a spread of 120 feet at the mouth. Its dimensions depend largely on the size and power of the vessel. They are made of two-inch stretched mesh

• continued on page 27

This Pamlico Sound scene shows a trawl emptied on the deck. Of some concern is the disposition of young fish in the net. This problem will require the cooperation of all concerned.

The Wild Prussians of Hooper Bald

by Frank Mooney

THE rugged, scenic beauty around Hooper Bald is magnificent on a clear, bright day. The towering peaks reach up on every side as if clutching their beauty, reluctant to share their splendor with anyone. On a cold, crisp morning the frost layer that can be seen remotely from Hooper Bald, looks like a sparkling clear lake surrounding the solitary mountain.

Hooper Bald is approximately 50 acres of mostly native bluegrass interspersed with some low brush. Some Graham County residents drive horses and cattle up the 5,429 foot slope to browse on this lush growth during the summer months. The surrounding peaks lack this bluegrass and grow the natural clumps of laurel and other dense foliage. In the thickest growth the sunshine never reaches the forest floor.

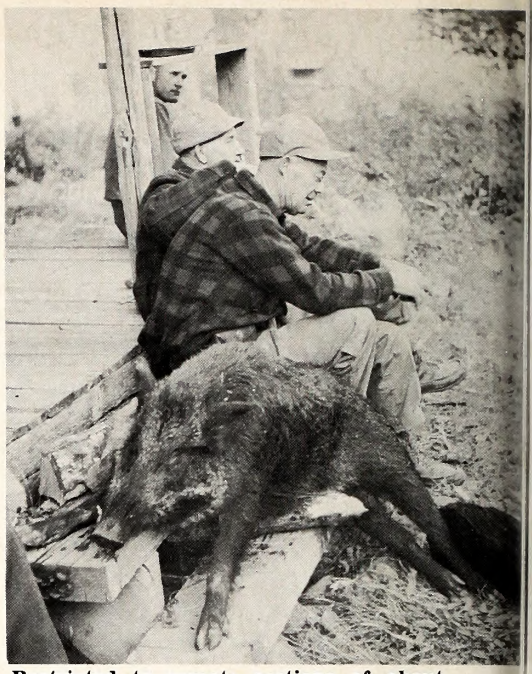
It staggers the imagination to see a bald spot when the remaining forest is densely clothed. The laurel and rhododendron thickets and dry gorges create a haven for the wild Prussian boar and it is almost impossible for man to penetrate effectively enough to flush out this elusive hog. Mr. Fred Bruckman told me about a pack of dogs that fought a wary old boar in a laurel clump for three days and never did drive the critter out. It was too thick for the hunters to drive the quarry out or go in for the kill. This regal country is as wild and unsettled as when the Prussian boar were first planted on Hooper Bald some 55 years ago to roam this remote land.

The story of how the boar were first released is fascinating and I believe most readers will be enchanted to learn about the man responsible for this and how it came about. The mystery man of Graham County was Mr. George Moore of New York. His dream became a reality after several thousand acres of rugged forest were leased around Hooper Bald on Snowbird Mountain. Then two houses were built, one the likes of which no one had ever seen in Graham County. This hunting lodge was a two-story structure, 90 feet long and consisting of 14 rooms, and two baths with hot and cold running water. The other house was built below the lodge for the caretaker to reside in.

The big house was completed in 1910, then to the amazement of everyone, in 1911 men were paid $1.25 a day to build a rail fence, eight rails high around 600 acres. Then to add more to the fantasy, a thousand acres were surrounded with a wire fence eight-feet high! Even a telephone was installed with miles of lines stretching across clear mountain streams, laurel and rhododendron slicks and rocky gorges. Inside these enclosures were released eight buffalo, 16 elk, 200 turkeys, six mule deer, 34 black and cinnamon bear and 13 wild boar. The wild boar were reported to have come from Germany.

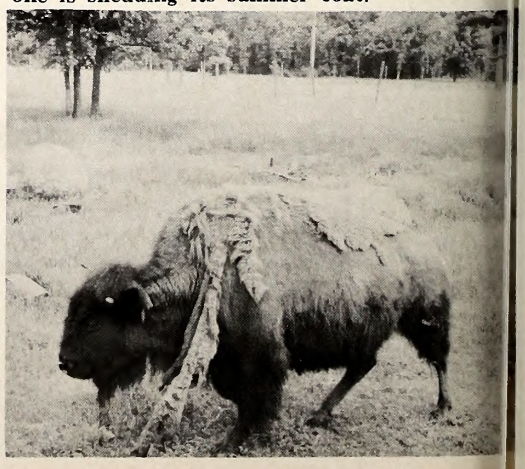
Some animals came by rail to Murphy, then were hauled 30 miles by wagon. Others went to Andrews Station, there transferred to lumber rail. One wagon and four horses were necessary to haul one buffalo. Some of the bear were almost as large; the largest were monsters in their own right.

Mr. Moore had men from New York and other places stay at his lodge and accompany him on some of the hunts. But much to their dismay, the bear tore down the fence during their attempt to climb out. The wild boar leaped the rail fence in low places when cornered and bayed by the dogs. Poachers shot most of the turkeys. The last elk was shot in the 1930's. Some elk were live trapped and sold to the North Carolina Game Division. Some of the buffalo with their constitutions were a long time in dying. Some of the animals raised several offspring during their captivity, but the buffalo seem to have the least success. The buffalo's native habitat calls for plains and level country. The remaining few



Restricted to remote sections of about nine counties at present, the boar is a rugged adversary.

Moore's rather fantastic scheme included the release of a buffalo herd. This one is shedding its summer coat.



were driven down the long trail. When the drivers stopped the beasts for a brief rest, instead of resting they bolted into the brush and escaped. 'Most every hardy soul of Graham County turned out for the last North Carolina buffalo roundup. Ten buffalo were shot.

Mr. Garland (Cotton) McGuire was the caretaker and lived below the big house. After Mr. Moore discontinued his visits, Cotton stayed on looking after the place. Mr. Moore called Cotton to his New York office where he told him that the place was his and gave him $1,000.00 in cash.

While I was on Hooper Bald, I walked to the deteriorating remains to see the wonder and powers of mankind. My Uncle Dave Chandler said after an hour of grueling riding up to the Bald, "I thought I had been in the mountains before, but now I know better." My Uncle is 62-years old, but still well conditioned. I wrote Mr. Fred Bruckman at the Blue Boar Hunting Lodge, Robbinsville, North Carolina, several months before going on the hunt. Mr. Bruckman lived most of his years in Ohio, but after retiring, built a hunting lodge near his beloved hunting grounds. He first hunted the wild boar around 40 years ago, and it is still one of his great loves.

Anticipation was terrific while waiting for that week to roll around. Mr. Bruckman was expecting Uncle Dave and me for dinner at his lodge for the six o'clock serving on Sunday, the seventh of November. The distance was around 370 miles as we left Roxboro, Sunday morning about eight o'clock and took a leisurely trip. We reached the lodge at 5:30 p.m. and enjoyed a delicious meal.

The next morning at six o'clock, the guide, Huel Orr, picked us up and started for the wild boar's stamping grounds. Huel is well developed, in his early 40's and has the wind-tanned look for which guides are noted. After a man-sized breakfast of eggs, bacon, grits, and coffee under my belt and a packed lunch in my hunting coat, I was ready to conquer the first mountain. About half way up I was ready to give in; my hunting territory is flat country!

We met Ed Belcher and Oliver Ingram from Martinsville, Virginia, at the rendezvous and talked over the plans for the day. Ed and Oliver are outdoorsmen from the word go, and live for these outdoor jaunts. Huel had eight dogs, six were kept on leash going up the winding, almost straight up at times, trail. The dogs were straining at their leash, and I wished several times before reaching the crest that I had a couple to help me. At one point, I glanced over my shoulder to see if some hunter had latched on for a free ride. After Huel put us on the selected spots, the dogs were released.

The hole in the dog's chest (left) was made by a mad tusker. It takes something more than courage to face a boar.

Running wild hogs with dogs has been a tradition handed down through the years, and makes for a rugged, exciting sport. It takes stamina and grit to follow the boar dogs through that rugged terrain. Prussian boar are hardy individuals and rate high on America's big game list. These hogs are also called Russian and "Roosian" wild boar. Their physical characteristics differ from our domestic type. A large boar's body resembles that of a buffalo: a short neck, and standing higher with heavier shoulders. Their hindquarters are relatively small compared with the rest of their body. The long tail has a tuft of hair at the tip, and a coat of coarse, stiff bristles covering the head reaching downward to the hips. In winter, a fine layer of wool grows beneath the coarse hair protecting the big hog from the frigid weather. These critters have to be skinned instead of the familiar hog scalding that most farm boys are accustomed to. A pair of awesome canine tusks protrude from the lower jaw. The matching upper jaw tusks curve upward to grind against the lowers at every touch, honing them to a razor-sharp edge. These formidable weapons sometimes grow to a length of eight inches. With these, the boar is capable of disemboweling an opponent.

Without the help of trained dogs, the chances of seeing a wild boar would be almost nil, unless there were several hunters to beat the brush. Even with a number of hunters driving, the chances of seeing one are slim. Most boar are killed at distances of 30 to 60 feet; visibility is a limiting factor. The hogs usually cross a high ridge near the highest point through a saddle or deep cut. The crossings are usually visible to the experienced eye, and most often the rooters are bagged crossing a ridge. The 30-30 and 30-06 rifles seem to be the most popular with boar hunters, with a heavy slug. I had a rebuilt 30-06 using a 180 grain bullet.

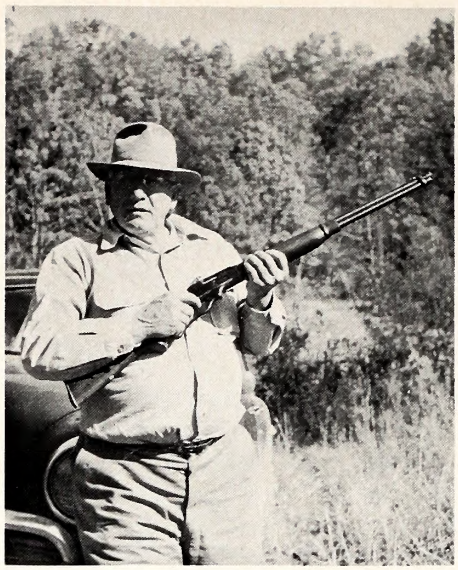
The dogs trailed awhile before making a jump. The pack split, chasing two hogs. I had read some fearful stories about the boar's aggressiveness, so I quickly picked a tree that I could scamper up if necessary. About 40 minutes later the dogs were pushing a boar toward me at a blistering pace. It seemed impossible for dogs to run that fast through the dense foliage. The Prussian boar must be as surefooted as mountain sheep. The chase turned abrutply before

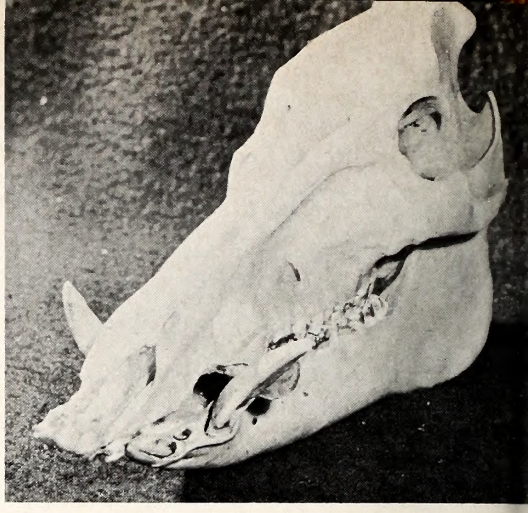
reaching where I crouched with rifle ready. The hounds tore down the mountain side bawling at the top of their voices without letting their adversary catch a much - needed rest. The dogs made several circles near the fringe of the mountain before going over the top and out of hearing.

The rest of the dogs had already gone over a ridge to my right pushing a hog toward Santeetlah Lake. Several minutes later I heard muffled sounds in the dry leaves as two animals moved slowly along the lip of the rim heading my way. The critters were traveling gingerly, taking several steps then stopping and staying well in the bush. After what seemed hours (but probably consumed only minutes) of staring through the undergrowth, I glimpsed a brown coat. A white-tailed deer's head emerged momentarily, then seemed to evaporate as if swallowed up by the earth. After moving about 200 feet down the slope, the deer bedded down. A redbone hound jumped the pair later, and they crossed the path below me. Deer season would open in two weeks.

A couple of hours elasped before the guide and Ed Belcher came by with part of the dogs. They told about the other dogs that hotfooted over the mountain, burning up a wild hog track. The rest of the afternoon was spent looking for the rest of the dogs, and one black and tan hound had a long, deep gash that would require some stitches to put it on the recovery list. The boar had cut the dog to the hollow, the intestines showed through the gash.

The white pine and hemlock make this country more majestic. After spending a day or two in the mountains, a man seems to breathe deeper. The next day we were to hunt on Snowbird Mountain. We lost some time repairing the Jeep gas line that was broken as the rig slid over several sharp rocks, but without a four - wheel drive vehicle I wouldn't attempt to maneuver





This is Garland (Cotton) McGuire, caretaker of the estate in a 1954 photo. Above, this boar's skull shows the armament of an adult hog. These tusks combine with sharp hooves to spell trouble.

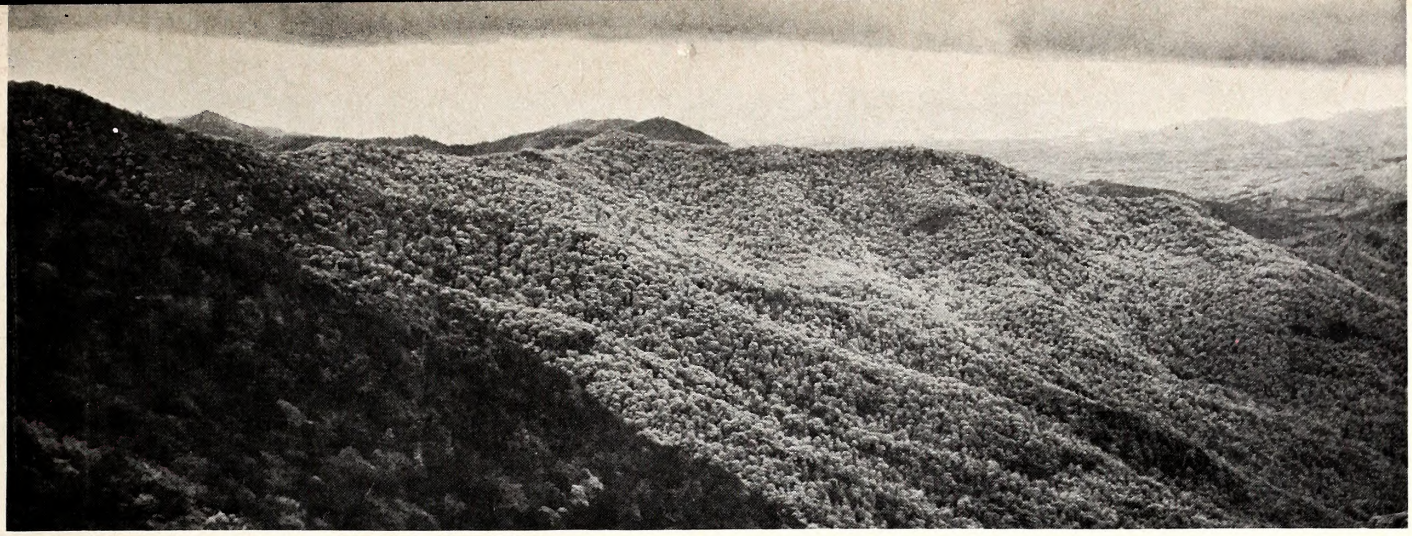
many of those back roads. Usually, we could drive within a mile of where our stands were located. Before reaching our destination we located a spot where several hogs had wallowed during the night. The dogs were whining impatiently because the scent still lingered in the crisp air.

Hunters and dogs alike were anxious to start the hunt. Everybody hurried to a crossing, the dogs were unleashed and the race was on. The dry leaves were crisp and the few that remained on the elm trees were making noises very similar to a bowl of rice krispies after pouring in the milk. The sound of footsteps seem to linger before fading into the brush. Willard Duvall had accompanied Huel Orr with his pack of dogs to help drive these crafty hogs from their lair. They both agree that part bulldog and hound is the best dog for hunting wild boar. The only reason that I dislike the bulldog is their failure to "give mouth" at times when running a smoldering track; but they do love a brawl and are very aggressive. Even the cross type often go over the ridge and out of hearing before you realize they have jumped their quarry, unless the hog is nearby when flushed.

Their dogs were of several breeds—redbone, Walker, black and tan, one brindle bulldog and bulldog and black and tan mixed. The dogs soon jumped and the bawling of the hounds echoed up and down the gorges filling the entire mountain with their urgent business at hand. It's always difficult for me to sit still during a hot chase, and now the dogs were pouring it on. I felt like jumping up and down, but I restrained myself because movement on crossings and stands by hunters save more big game animals than any other mistake made!

The dogs crossed below me where the guide was trying to cover the ridge. Shortly, a 30-30 blast rang out; then silence again except for the music of the dogs. The pack continued down the ridge pushing their quarry as if the trail were paved. The forest once again was silent and I began to think about the packed lunch in my coat. The hunter has to be alert and ready whenever the boar is caught and he should try to reach the fight before the wily hog can break loose. Some of the mountain men will wade in and cut the hog's throat after their dogs have caught and held the critter. The wind had herded the clouds away and let the sunshine out to bathe the forest with its warming glow. The warmth on my back felt good and I almost drifted into a light sleep.

A faint rustle behind me brought things back to reality. Easing around in a slow deliberate motion, I saw two hogs bristle up trying to scent any danger. They had emerged from the brush like wisps of smoke,



The last stronghold of the wild boar in North Carolina: the trackless mountains. Although the boar has been introduced into at least one coastal county, the critters seemed to find the high country more like their native Black Forest haunts. It's unlikely they will ever be abundant in North Carolina.

now they stood facing me about 120 feet away. Wild boar are noted for their keen sense of smell and poor eyesight, but I knew any motion even for a near-sighted porker at this distance would be detected. I knew at the least sign of danger I would once again have the ridge to myself; the hogs would be gone in a quick bound over the rim and into the dense brush.

I turned, snapping off a shot in the same motion. The hog went down and rolled up again almost faster than the eye could register it. Both animals crashed through the brush. I squeezed the trigger as the hog filled a clearing in the trees. Letting out a high-pitched squeal, it slid into a tree. I gave it another shot for precaution. Usually, if the hog succeeds once in fading from sight that's the last time he is seen. The other one ran toward where my uncle was covering another crossing.

After field dressing the hog, Huel came up and related his bad luck. Three hogs running together crossed within 30 feet of where he was crouched, and the 30-30 lever action would not fire. After the hammer fell but did not fire he assumed the chamber was empty. After ejecting the shell and sliding in a new hull it still misfired. Then he managed to get off a hurried shot as the fleeing hogs disappeared over the crest but failed to connect. The yelping dogs were still running hard coming his way on what he thought was the three hogs' trail. But before the pack reached him two more porkers burst over the ridge, running the same path as he stood there with a malfunction.

The Prussian boar have spread into eastern Tennessee, and the Tellico Plains Management Area is noted for this elusive big game species. The old hogs when pushed hard usually head for Nantahala National Forest or Tennessee. Our next chase (after the hog eluded us) led the pack a long hot trail into Tennessee. Huel and Willard left their rifles with us and proceeded to catch the dogs. It's illegal to bear arms while looking for dogs in Tennessee without a valid license. It was dark before they returned with the rest of the dogs.

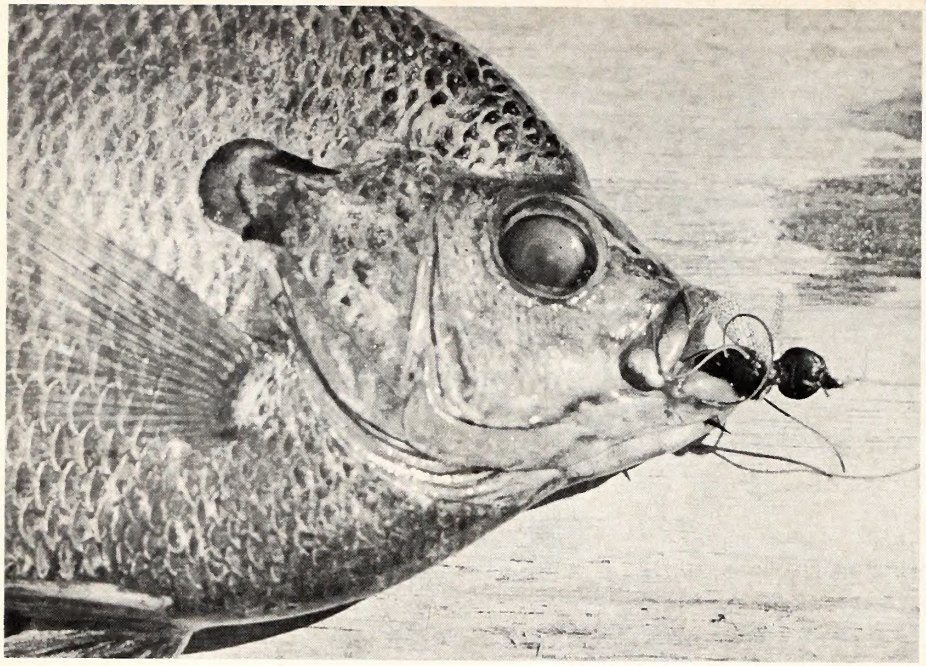
The following morning we drove to Andrews, North Carolina, to see Mr. Bruce Bristol who raises the wild Prussian boar. He had 69 or 70 hogs including two unweaned litters. Down through the years some domestic blood had mixed, but Mr. Bristol said that every piglet is born true to color. The young are yellow striped at birth, and beautifully colored. Their stripes disappear as they mature. The adults are almost solid black. Mr. Bristol said anyone interested in obtaining some stock could contact him. He told me about a sportsman from Maryland that was buying 30 of his young ones. The weaning size sell for $25.00 each; a shoat for $50.00.

Some hogs were captured recently on the Tellico Management Area that were still full-blooded European strain. On the 37,880 acre Santeetlah Wildlife Management Area, hunts are allowed according to a schedule furnished by the Division of Game, Box 2919, Raleigh, 27602.

The group has to have reservations prior to taking the hunt and dogs are used. Ed and Ollie were telling about still hunting in the area on Wednesday (no dogs allowed). Someone had shot and wounded a wild hog, but were afraid to pursue it. Ed and Ollie tracked the critter until it stopped bleeding, then lost the track. It cost each hunter $4.00; $2.00 for a boar permit and $2.00 for bear. When hunting wild boar there is always a chance of killing a bear. The week that I was hunting, two bears were killed near us.

Percentage wise, the kill is not as high as some other types of big game hunting and very few nimrods have a wild Prussian boar hanging in their trophy room. I was lucky to make a kill on my first hunt. It was not one of the "monarchs of the forests", but it was a trophy for me. A trophy does not have to be an overweight specimen to be worthwhile to me.

The rates are very reasonable. Mr. Bruckman charges $10.00 a day for room and board per hunter. The guide and dogs are $15.00 a day and the fee is divided among the hunters.



To Tie a Bug

by Luther Partin

Photos by Tom Jackson

THERE is an extra bit of satisfaction in catching a fish on a lure you have made. The fisherman has a decided advantage over other sportsmen in this respect.

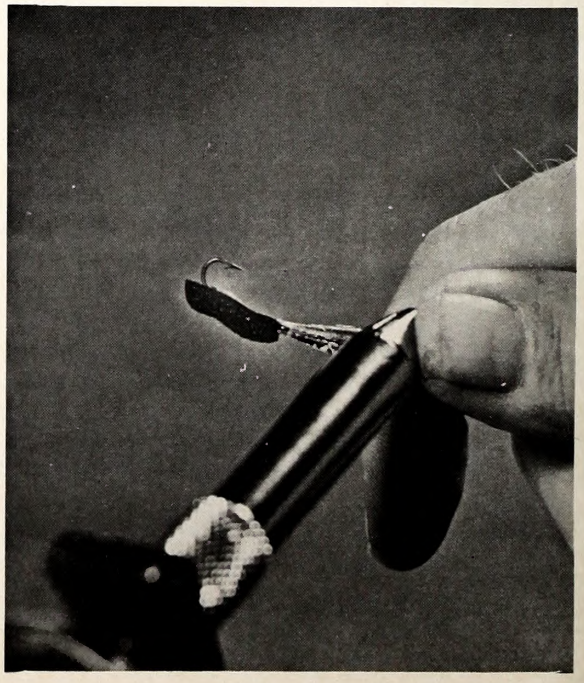
Panfish lures can be made for a few cents each (excluding labor and capital investment in vise, pliers, etc.). The sponge bodied bug is sometimes irresistible to bluegills, bass, robin and other species too numerous to mention. Possibly the secret to its success is the simplicity. It's just a piece of foam rubber impaled on a hook, with or without legs and wings.

The question of whether to add legs and wings is a matter of choice with the fisherman, as he is probably the only one who cares. With color it's the same thing again. Choose one or several colors that you like because the fish couldn't care less, it usually seems. The fact that one person can only catch bluegills on a yellow bug is probably due to a reluctance to give any other color a real chance to prove its worth.

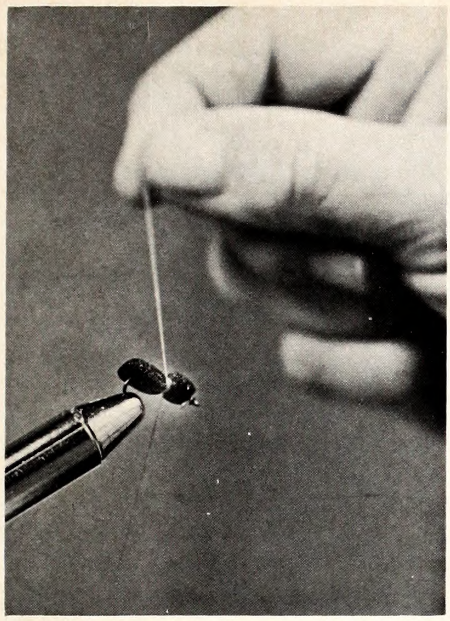
The materials needed can be obtained from some sporting goods dealers or a national supplier such as Herter's Inc., of Waseca, Minnesota. If you're game to tie a bug, don't worry too much about the appearance of your first few. Fish take lures that resemble nothing they are used to eating. Maybe they're like some humans—always ready for a change in diet. The accompanying photos show how one fisherman ties a bug. ⬍

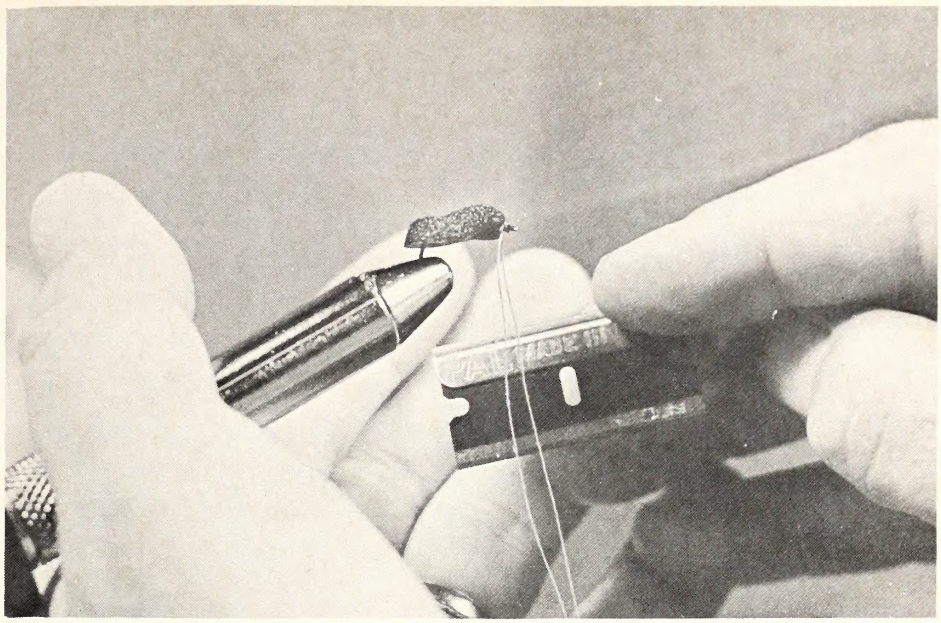
Most of the basic materials for making a fish-catching bug are shown here: some medium-weight thread, plastic wing material, large needle, hump-shanked hooks (6, 8, and 10), and shaped sponge bodies. Add white or black rubber legs if you like.

Text by Luther Partin Photos by Tom Jackson

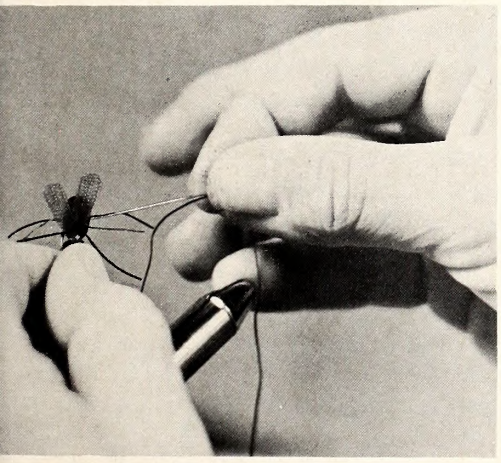


Step 1, push a hook coated with wet fly-head cement through the sponge body. Allow it to dry a few minutes.

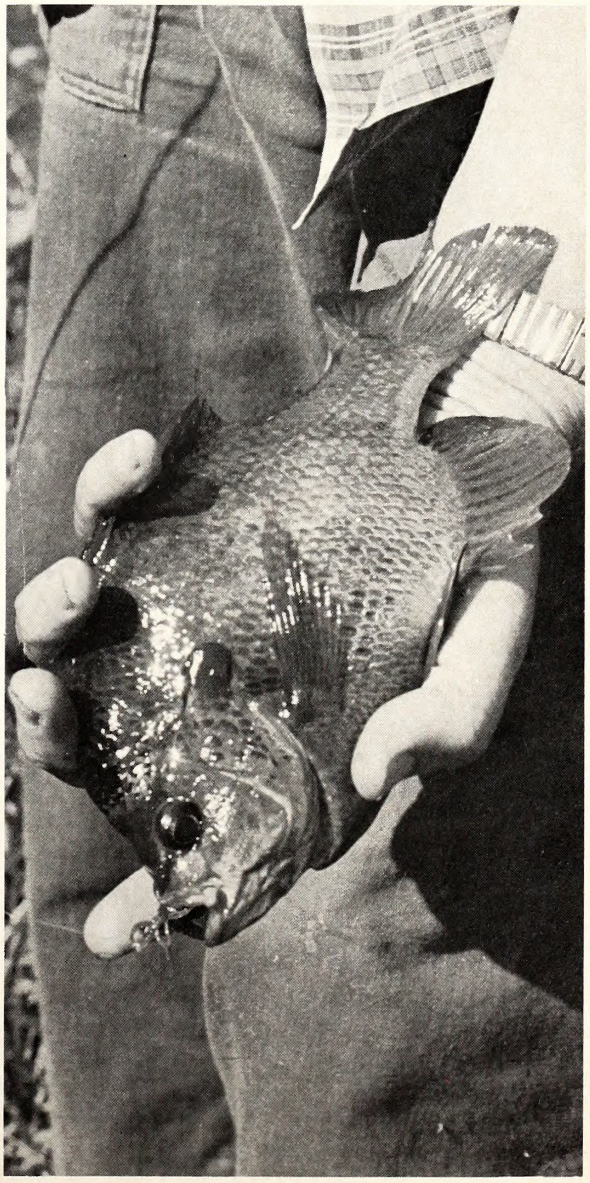


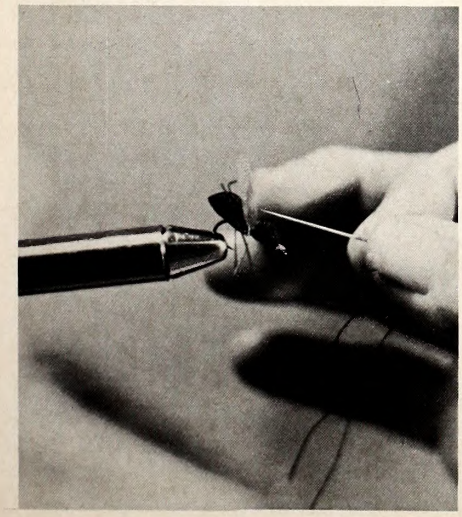


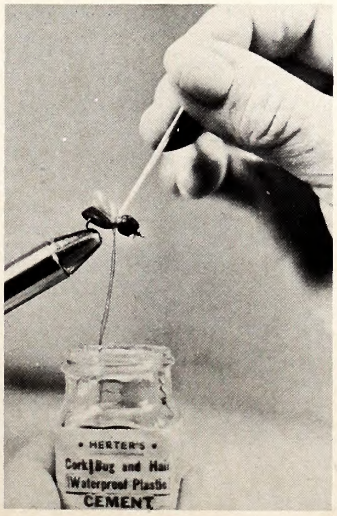
Segment the body (2) by tying several turns of thread around the bug's mid-section and head. (3) Snip thread.



The plastic wing material (4) has been cut and shaped. A few turns of thread secure the pair to the bug's back. The needle is threaded with heavy thread or rubber leg material and poked through the sponge, back of the wings. Photo 5 shows the spot. Snip the legs (three pair) to the desired length. A coating of waterproof cement applied with a toothpick (6) will protect the windings. Do they catch fish? This handful of bluegill fell for one.

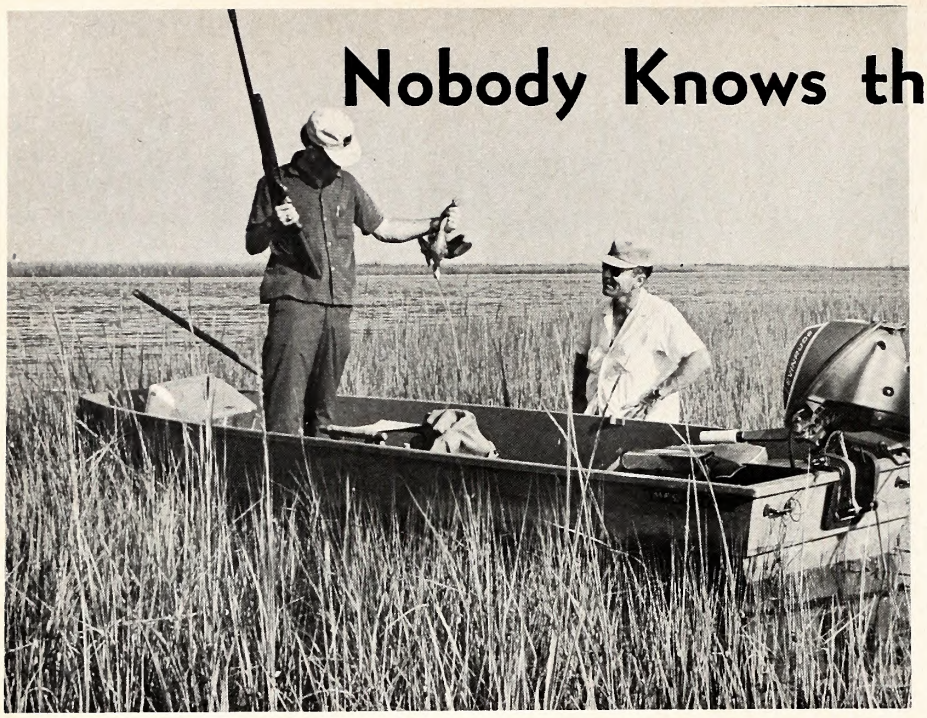






Nobody Knows the Marsh Hen

by Luther Partin



How many times have you gotten your limit of marsh hens? How many times have you killed one? Why not give them a try in the next week or so? Get to know the marsh hen.

SEPTEMBER brings the opening of the first half of the dove season. This is news to practically no one as you can tell by the number of gun barrels that will be pointed skyward at twelve o'clock noon on opening day.

September also ushers in the marsh hen season—a sport not as well-attended as dove shooting, but one that may have as much or even more to offer if you like a more vigorous type of outing. The sights and sounds of the marsh—the more elaborate preparations and the anticipa-

Where are they? It will take a bit of pushing (above, left) or paddling (lower, left) to find them. Their exit from the tall grass isn't as explosive as quail from a field. Some of the rail family often dine on the snails which are abundant (below).

tion of flushing a bird momentarily — all contribute to the marsh hen's great attraction to many sportsmen.

The marsh hen is very tasty when it has been feeding on wild rice. The bag limit of 15 daily and 30 in possession is typical of a game species with a high reproduction capacity and low hunting pressure.

The difficulty in flushing marsh hens is probably a major factor in the low hunter exploitation of this sport. Good hunting is generally limited to the day of the highest tides when most of the vegetation is under water and good hiding places for the birds are scarce. They are usually hunted from a flat-bottomed boat that is poled over the grass by a guide or hunting companion. Wading may be preferred if the poling is too much like work, but protective footgear is a must.

Some hunters compare marsh hens to quail in that the type of shooting is similar. However, the marsh hen's flight is slower, much more erratic, and you don't have an explosive flushing sound to put you on guard or scare the wits out of you, as the case may be. But the thrill of the flush and challenge of the quick swing shot are very similar and a good quail gun should be a good marsh hen gun.

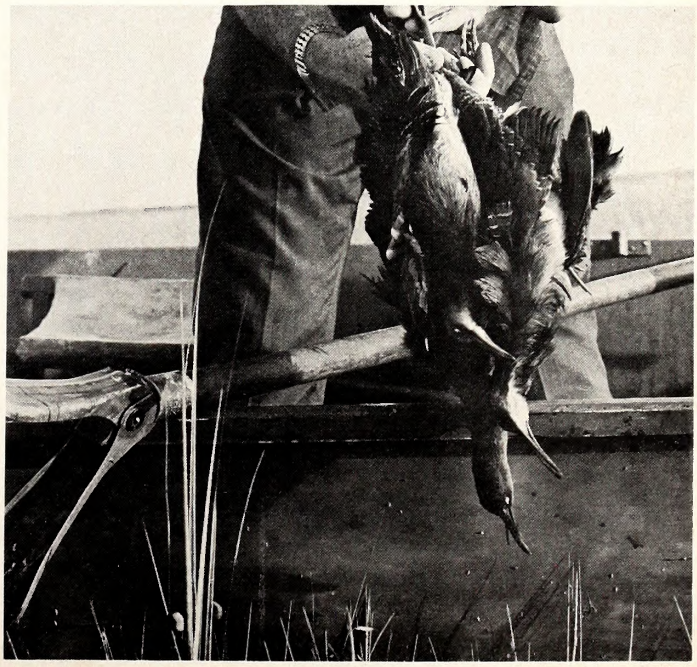
The following table gives the highest tides during the open season. (September 12 through November 15). However, on a given day, the wind factor can cause an increase or decrease in the expected tide level, depending on the direction in which it blows.

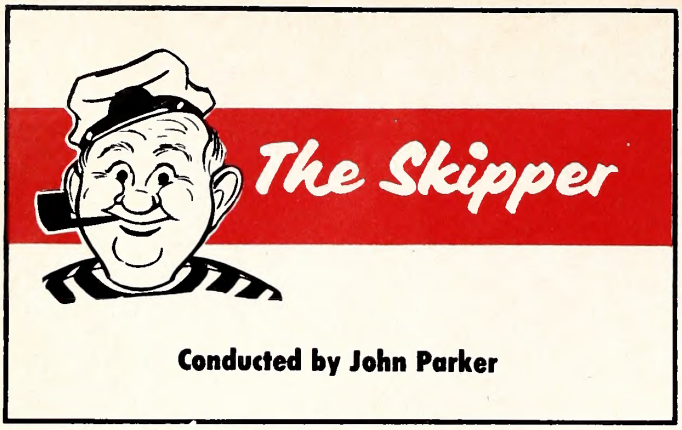
Wading (don't forget the protective footwear) may be productive if it is practical. Retrieving the downed birds may be a problem. Below is the king rail, the largest of the marsh hen group.

Tide Table, Southport, N. C.

Month	Date	Time	Height (Feet)
SEPT.	12	554PM	5.3
	13	648PM	5.5
	14	718AM	5.0
	15	806AM	5.4
	16	900AM	5.5
	17	948AM	5.5
	19	1136AM	5.1
OCT.	10	436PM	5.0
	11	530PM	5.2
	12	624PM	5.3
	13	654AM	5.5
	13	718PM	5.3
	14	748AM	5.8
	15	836AM	5.8
	17	1018AM	5.5
	18	1112AM	5.2
NOV.	10	542AM	5.2
	11	636AM	5.6
	12	730AM	5.7
	14	906AM	5.6
	15	954AM	5.3

Select a flat-bottomed boat with plenty of stability. The camouflaging won't help much here. One secret to successful poling is the "duck foot", business end of the pole. It spreads out when pushed in the mud and gives better footage.





Conducted by John Parker

Row, row, row your boat . . . or do you? The use of oars is rapidly becoming a lost art. Here are some tips on selecting oars and using them properly.

A fishing season or two back, I mentioned in this column that the art of rowing was becoming more popular; at least that's what I read somewhere.

Is rowing increasing or declining? Right now I am really not sure. At any rate, for the next few lines, let us take a look at oars and rowing.

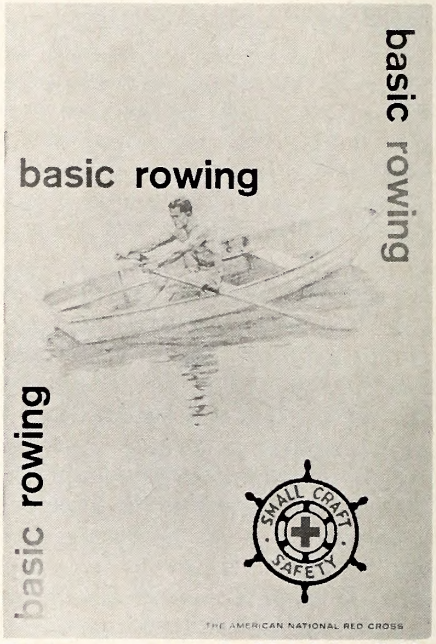
Rowing, if you have not tried it, is good exercise. Yours truly found this to still be true a few months ago. Here then is one good reason why we suggest you try it. But that's incidental. Actually rowing has its advantages in fishing and there is also a safety advantage when a boat is equipped with a pair of oars—and a true oarsman, we might add. Those two points will be discussed briefly but let us start with a few basics.

First, one rows a boat with a pair of oars. One paddles a boat with a paddle. If you have had any experience with the two, you know that they are shaped differently but both have a basic likeness (both have blade, loom and handle or grip). Most oars in everyday use are longer than most paddles. But you can buy paddles and oars of the same length. Incidentally, a boat can, obviously, be paddled with an oar if you have the misfortune to lose an oarlock horn or break one oar.

The real difference in paddles and oars is in the way they are used. Paddles, of course, are held with both hands while oars are set in oarlocks. The oarlock acts as a fulcrum and the blade exerts pressure against the water.

The normal position for rowing is with the oarsman facing the stern. He would most often center himself on a midship thwart or seat. We should point out here that for the sake of safety and in order to row an intended course the oarsman must develop a regular pattern of looking over his shoulder. Others in the boat should help keep a close watch. And, additional passengers and gear should be positioned so as to permit the best balance. One passenger, for example, would sit on the aft or rear seat but this would depend on whether you had a motor and other gear.

The stern facing position permits the oarsman to really put his weight into it. Very little serious rowing is done from a forward facing position. Push rowing (done while standing) and sculling are both done while facing forward but these specialized methods are not in common use. Other positions for rowing include two people on the same seat facing the stern and each with one oar (double bank sweeps), two rowing from different seats or thwarts on different sides of the boat each with one oar (tandem sweeps) and two rowing from different seats each with a pair of oars (tandem paired).



This comprehensive booklet is available for 35 cents from the American National Red Cross, 1955 Monroe Drive, N. E., Atlanta, Georgia 30324.

We have all seen, at least in pictures, the long, lean, racing shells with eight or so oarsmen. Such oarsmen are putting a polished touch on some of the basics you need to know for rowing enjoyment. Then there were the Greek galleys but that's going a little too far back.

It is interesting, however, when we stop to think of the places that people have traveled at the end of an oar. In last month's Skipper we mentioned a new transatlantic rowing marathon. Since that time we learned that in 1895 the task was accomplished in 55 days, New York to London by two men. The point being that you can get somewhere with a pair of oars.

Oars are available in lengths from five to twelve or more feet. If I had to pick a best all-around length, I would choose the seven footer. Ideal for most 12-foot boats, the seven-foot oar would probably do in a pinch for slightly larger or slightly smaller boats. The main factors in choosing oar length is the width of the boat (beam) and freeboard (distance from water to top of side or gunwale.). This is in contrast to paddle length which is most often determined by the size of the paddler. Efficiency and rowing comfort depend on proper oar length.

Oars are most commonly made of ash or spruce. The cost may vary from about $6 to well over $10 a pair depending on length, wood quality, shape detail and finish. The cheaper the oar, the more you may have to search the display rack for a truly matched pair. Painted oars in a cheap line may have poor grain (not straight, knots). This, of course, depends on the reputation of your dealer.

It is recommended that all except the handle (the last few inches of an oar) be painted or varnishd to protect the wood. When stored, oars should be hung vertically or stood vertically, blades up.

We have yet to mention the oarlock. Without some form of an oarlock, and there are several, the oar would be no more than a glorified paddle. The standard oarlock consists of two parts, a socket which is affixed to the gunwales is one part. This socket holds the oarlock horn in which the oar rests. There are "round horns", horns with pins (to hold the oar in) and oarlock horns without pins.

Accessories for oars? Yes. There are metal protectors to cover the tips of the oar, a button or oar stop to prevent the oar from sliding through the oarlock, leather to keep the oar from being chaffed by the horn, safety chains or lanyards to prevent the horn from being lost from the socket and a gadget to lock a set of oars in your boat.

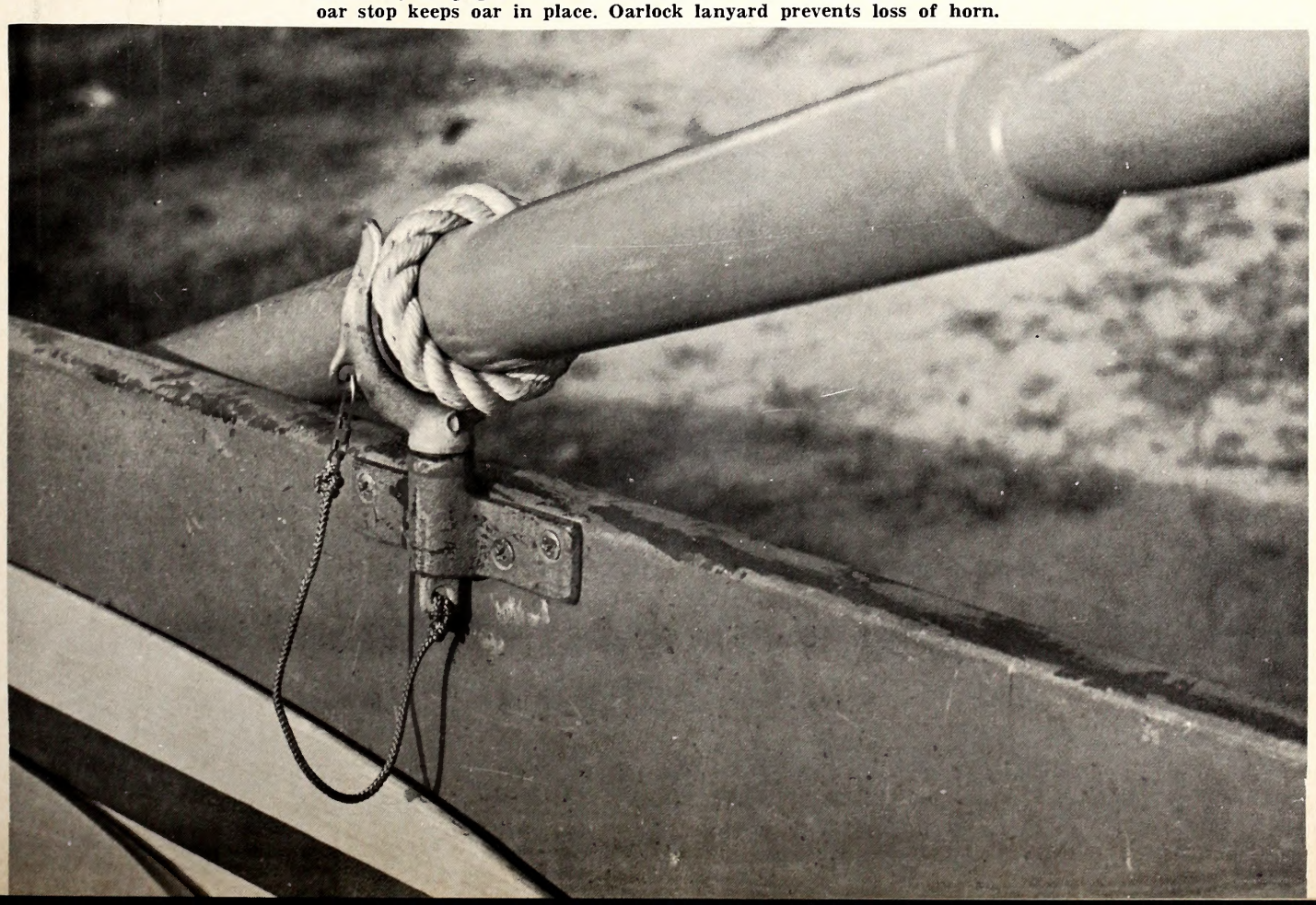
All told you can rig your favorite fishing boat with a set of oars for $15 or so.

What have you purchased along with an aid to exercising? As a fishing aid a pair of oars is second to none except perhaps the electric motor. When casting a shore line you can row, drop the oars (if they are pinned or equipped with buttons) and cast. No need to ship the oars. You can also troll by rowing. And if you just like it quiet, you can change sides of the stream or cove with only the swish of the oar to interrupt the natural sounds. You will soon find that rowing a fishing utility boat is less awkward and less strenuous than paddling.

Safety? Yes. Ever try paddling upstream or against the wind after the motor has kicked off? Suffice to say that a man with basic rowing knowledge can tackle a longer distance over a rougher course than can a man with a paddle. I suspect many of the capsizing or falling overboard accidents are caused by people hanging over the gunwale of small, low free board boats, putting too much steam behind a paddle.

None of this is intended to discredit the paddle nor its place among outdoorsmen. The intent is to point out the usefulness and versatility of a set of oars. ⬍

Release your grip on the oar and make a cast; this rope button or oar stop keeps oar in place. Oarlock lanyard prevents loss of horn.



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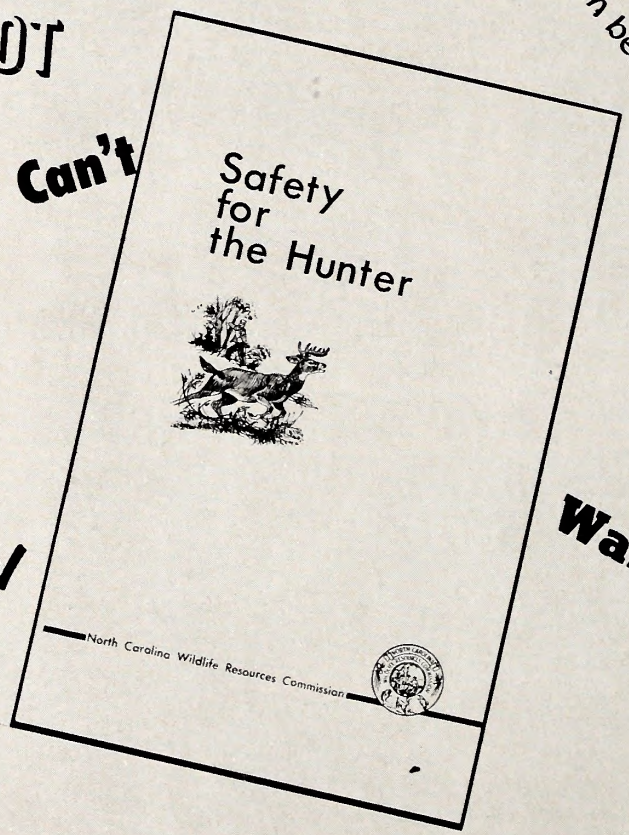
LOOK BEFORE YOU SHOOT

THINK! Your Trigger Can't



Practice self control

Watch That Muzzle

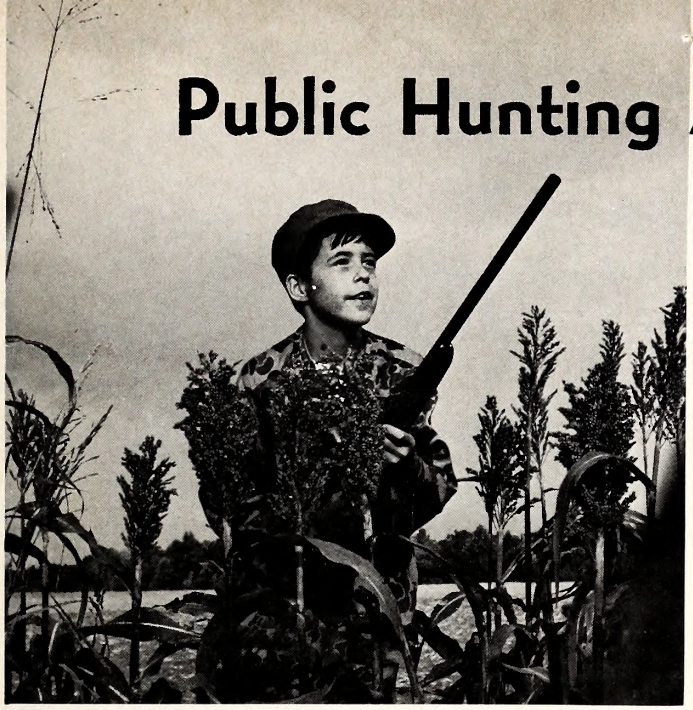
Don't YOU Become an Accident Statistic

Write today for one or more copies

Write to HUNTER SAFETY, Box 2919, Raleigh, N. C. 27602, for your copy of Safety For the Hunter or for information on how you can become a certified Hunter Safety Instructor.

Train That Young Hunter NOW

Public Hunting Areas — 1966-67



by Ted Mitchell

THE opening day of the 1966-67 dove hunting season, September 7, marks the seventh anniversary of the North Carolina Wildlife Resources Commission's public dove hunt management area program. This project, designed to help city sportsmen gain access to the more attractive dove hunting fields, began with ten areas and has been expanded by public demand to 21 areas developed for the current season. This total includes two areas which were developed in connection with the Commission's brand new public small game hunting area program. They are, therefore, subject to hunting dates and rules developed for the new all-species hunt areas. These two areas are: the popular Corinth Community Farms in Granville County and the newly acquired Mitchell Farms in Harnett County. To conform with established small game hunting dates, dove hunting will be allowed on Monday, Wednesday and Saturday afternoons throughout the announced dove hunting season on the Granville and Harnett county areas. On the 19 "dove only" management areas hunting will be on Wednesday and Saturday afternoons only, as in past seasons.

While the Commission has been able to "squeeze" the cost of leasing and developing public dove hunt areas into a limited and demanding budget in past seasons, the time has arrived when it is necessary to call on the hunting public for minimal financial support in its projected program to provide more areas for public small game hunting. Beginning this season, a use permit will be required to hunt on any and all wildlife management areas which schedule small game hunts. This permit allows one to hunt on scheduled hunt days throughout the established seasons on the 19 designated dove management areas, the seven small and migratory game hunt areas, on most Commission-owned wildlife management areas which do not have checking stations, and for small game only on wildlife management areas which operate checking stations.

A better bargain you couldn't find in Macy's basement!

Funds derived from the sale of small game hunting permits will be ear-marked for use in acquiring and developing more public hunt areas.

To assist you in locating the public hunting areas, their approximate locations are plotted on the accompanying map and detailed directions for locating the sites are listed below.

A. The J. R. Braswell lands comprising approximately 2000 acres of land, 13 miles south of Monroe and east of Hwy. U. S. 601 on Secondary Road No. 1919.

B. The Frank Hall farm comprising 1340 acres of land located approximately two miles north of Cleveland on Secondary Roads Nos. 1971 and 1972.

C. The J. T. King and F. R. Keith farms comprising 2409 acres of land and located approximately two miles west of the town of St. Pauls on Hwy. U. S. 301.

D. The Mitchell Farms comprising 1552 acres of land approximately twelve miles south of Lillington, east of Hwy. N. C. 210 on Secondary Roads 2049 and 2050.

E. The Corinth Community Farms comprising approximately 2000 acres of land located approximately five miles northwest of the Town of Wilton on Hwy. N. C. 96 and Secondary Road 1618.

F. The William D. Holloman, Jr., Farm (Bellamy Farm) comprising 1089 acres of land located approximately seven miles north of the Town of Leggett, Secondary Roads Nos. 1423 and 1429.

G. The Sandhills Wildlife Management Area.

H. The Caswell Wildlife Management Area.

1. MACON COUNTY

The Jerry Sutton, George Dorster, and Ardell Cabe farms, comprising approximately 400 acres of land along the Little Tennessee River, four miles southeast of the Town of Franklin on Secondary Road No. 1653 (Clark's Chapel Road).

2. HAYWOOD COUNTY

The North Carolina Agriculture Experiment Station, comprising 355 acres of land, approximately one mile east of the Town of Waynesville, between U. S. Highways Nos. 19A and 23, and N. C. No. 276, on Secondary Road No. 1810.

3. RUTHERFORD COUNTY

The Earl E. Williamson Farm, comprising 400 acres of land located approximately two miles southeast of the Town of Logan and 4.5 miles southwest of the Town of Sunshine on Secondary Road No. 1559.

4. CALDWELL COUNTY

The Wilson Farms, comprising 400 acres of land located approximately three miles northwest of the

● Designated Public Dove Hunting Areas

★ Small and Migratory Game Public Hunting Areas with Development for Dove Hunting

□ Small and Migratory Game Public Hunting Areas Which Usually Have Some Doves

■ Checking Station Management Area with Development for Dove Hunting

Town of Granite Falls, one mile southwest of the Town of Sawmills and three miles south of the Town of Hudson on Secondary Road No. 1123.

5. CLEVELAND COUNTY

The R. F. Tillman Farm, comprising 60 acres of land located approximately three miles southwest of the Town of Toluca, two miles north of the Town of Bellwood on Secondary Road No. 1606 (0.6 mile west of N. C. Highway No. 18).

6. CATAWBA COUNTY

The Clarence J. Lowe Farm (Whisnant Dairy), comprising 420 acres of land located approximately five miles south of the Town of Startown, four miles west of the Town of Maiden on Secondary Road No. 2021 (0.8 mile west of Startown Road 1005).

7. YADKIN COUNTY

The E. Paul Windsor Farm, comprising approximately 200 acres, located approximately ten miles southwest of Yadkinville on Secondary Road No. 1100, one-half mile east of Windsor's Crossroads.

8. MECKLENBURG COUNTY

The lands of the County of Mecklenburg comprising 100 acres of land in Huntersville Township, approximately 12 miles north of the City of Charlotte on U. S. Highway No. 21, and on the east side of the highway.

9. UNION COUNTY

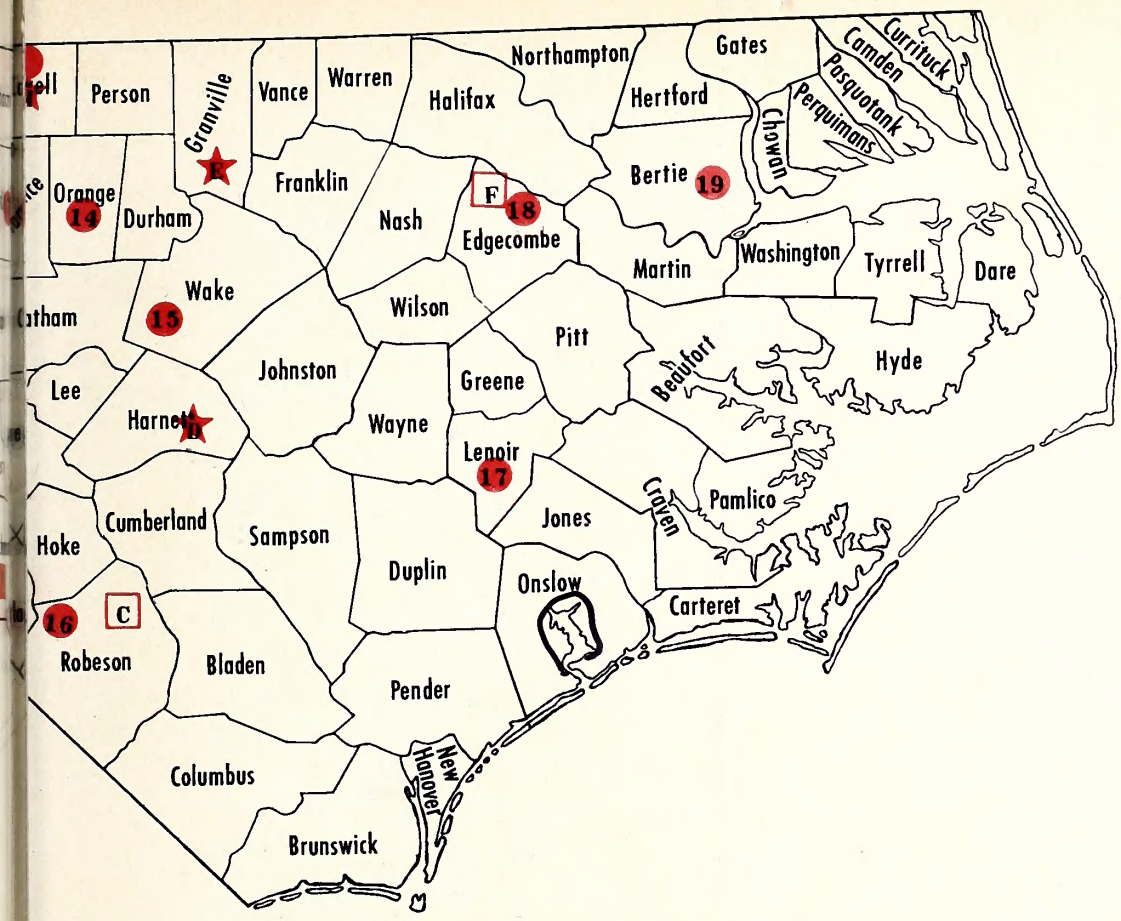
The lands of Leston Hilton, comprising 200 acres in Monroe Township, approximately twelve miles east of the City of Charlotte on Old U. S. Highway No. 74 (Monroe Road) to Sun Valley High School; go right on Secondary Road No. 1377 about one-half mile to Secondary Road No. 1353; turn left, and the farm is on both sides of the road.

10. CABARRUS COUNTY

The lands of Lawson A. Foil, comprising 136.5 acres in No. 8 Township, Cabarrus County; go two miles east of Mt. Pleasant on N. C. Highway No. 73 to Prison Camp Road (Secondary Road No. 2604; turn left and the farm is two miles on the left.

11. DAVIDSON COUNTY

The J. C. and Reece Crouse Farm, comprising 182 acres of land in Emmons Township, approximately six miles north of the Town of Denton on N. C. Highway No. 109 to Cid Road (Secondary Road



1966-67
Public Small Game and Migratory Game Hunting Areas

No. 2318), then east approximately two miles to the farm on the north side of Cid Road.

12. RANDOLPH COUNTY

The Richard Earl Johnson Farm, comprising 400 acres of land in New Market Township, located between U. S. Highways Nos. 311 and 220, four miles northwest of the Town of Randleman on Secondary Road No. 1939.

13. GUILFORD COUNTY

The Guilford County Farm owned by the County of Guilford, comprising 756 acres of land approximately ten miles northeast of the City of Greensboro, and two miles north of Town of Gibsonville on Secondary Road No. 2740.

14. ORANGE COUNTY

The Frank Perry Farm, comprising 400 acres of land, approximately three miles north of the Town of Hillsboro, between U. S. Highway No. 70 and N. C. Highway No. 86, on Secondary Road No. 1306.

15. WAKE COUNTY

The J. H. Aiken Farm, comprising approximately 450 acres of land, fifteen miles southwest of the City of Raleigh, and two miles north of the Town of Fuquay-Varina near Needmore on Secondary Road No. 1399.

16. ROBESON COUNTY

The Humphrey Brothers Dairy Farm, comprising approximately 400 acres, two miles northwest of the Town of Shannon which is between Red Springs and Lumber Bridge on N. C. Hwy. No. 71.

17. LENOIR COUNTY

The C. N. Stroud Farm, comprising 200 acres of land, approximately eight miles southwest of the City of Kinston on N. C. Highway No. 11, and one mile west of the Community of Albritton.

18. EDGECOMBE COUNTY

The Bill Dail Farm, comprising 600 acres of land, four miles east of the Town of Leggett on N. C. Highway No. 97 and one mile south on Secondary Road No. 1500.

19. BERTIE COUNTY

The James Delbert Evans Farm, comprising 130 acres of land, nine miles south of the Town of Colerain on N. C. Highway No. 45, one mile west on Secondary Road No. 1355, and 0.7 mile south on Pierce Road. ◆

NORTH CAROLINA WILDLIFE

RESOURCE-O-GRAM

A ROUNDUP OF THE LATEST WILDLIFE NEWS

Hunting Season Starts September 1

September 1 is the opening date of the season on rails and gallinules in North Carolina's coastal marshes. Again shooting hours are from sunrise to sunset, and the daily bag of these birds singly or in combination is 15 with a possession limit of 30. See elsewhere in this issue for tide tables.

September 7 marks the opening of the first segment of a split dove season with a daily bag of 12 and a possession limit of 24. Shooting hours are from noon to sunset. Dove hunters who shoot on public dove hunting areas will be required to have a season small game permit costing $3.00. These permits will be valid on a number of other public hunting areas where small game and waterfowl are hunted.

Public Drawings for Bear, Bear-Boar, Waterfowl Hunts

Drawings for party hunts for bear and boar on western wildlife management areas will be held at 9:00 a.m. Wednesday, September 14 in the Courthouse at Waynesville. Party hunt applications containing not more than 25 names must be received in the Wildlife Commission's Raleigh office by September 1 in order to be processed for the drawings.

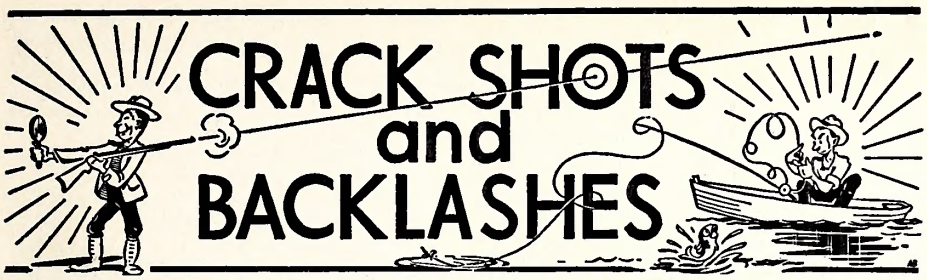
Waterfowl hunters wanting preferred dates for shooting blinds in the Mattamuskeet National Waterfowl Refuge must submit advance application forms to the Wildlife Commission's office at New Holland, N. C., prior to 6:00 p.m. on September 20. Application forms will be available from local wildlife protectors and from the Raleigh or New Holland offices of the Commission as soon as waterfowl hunting dates are announced by the U. S. Fish and Wildlife Service. A public drawing to determine successful applicants is scheduled for 9:00 a.m. at the courthouse in Swanquarter Thursday, September 22.

Boating Safety Law Enforcement

Labor Day weekend will mark the climax of the 1966 boating season with a record number of boats expected to be using public waters. The Wildlife Resources Commission's three airplanes and all of its patrol boats will be on hand to enforce the boating safety laws and regulations.

Public Hearings On 1967 Fishing Rules

The Wildlife Resources Commission has scheduled three hearings to give fresh water fishermen a chance to express their views regarding the 1967 fishing regulations. The hearings are set for Asheville September 27, Salisbury September 28, and Washington September 29. All hearings will be at 7:30 p.m. in the courthouses of the cities involved.



DEPARTMENT OF LETTERS TO THE EDITORS, FIELD NOTES, AND ITEMS OF INTEREST

Conducted By Rod Amundson

Time for Building

DEAR SIRS: For several years I have used your bluebird house plans with complete satisfaction. This year my daughter decided to take on a bluebird trail as a 4-H project, and I cut a dozen birdhouse kits for her use.

While I was at it, I cut kits for a class of deaf children, drilling the panels with pilot holes for easier nailing. Each child made his own birdhouse, and had a ball doing so.

Anyone with a power saw and a little time would find this a good investment. The cost and effort are minimal, and the personal satisfaction is tremendous. The kids enjoy building them, they learn about birds, the birds have a home, and the bug population goes down a notch.

In late March, bluebirds were already investigating the new houses. We look forward to a bumper crop of bluebirds this year.

Thank you for your help. We look forward to many future issues of "Wildlife." DARREL PEELER, LEXINGTON

DEAR SIRS: Since many of your readers are bluebird fanciers, perhaps they would be interested in the results of my experiments with nesting houses, and some thoughts on the care and cultivation of these beautiful birds.

Bluebirds will nest in practically any kind of box if they are not molested, but there are several ways to provide them with the protection they need to successfully raise a family.

Almost any kind of wood will do for birdhouses. Cypress is good, will last a long time and needs no paint, but I like cedar wood best. Aromatic cedar helps keep down bird lice and other parasites and does not need paint. Generally birds do not like painted houses, also some paints are poisonous to birds.

The entrance hole should be round, 1½" diameter, this will discourage starlings and larger birds. The inside dimension of the house should be about 4½ X 4½" and deep enough so bottom of entrance hole will be 8" above floor, then the eggs will be safe from jays and other predatory birds, also young bluebirds will stay in nest until ready to fly.

For ventilation bore several ½" holes on each side near the top and for drainage bore several ½" holes in the bottom. Provide no perch.

To protect the nest from cats and snakes use pipe to support the house. Old pump pipe is fine. Cut 8 feet long, sink 2 feet in ground, bore two holes about 4" apart near top of pipe for bolts to hold the birdhouse. An 8 ft. post is just as good but should be sheathed with tin to prevent cats and snakes from climbing. Never attach birdhouses to fence posts, that is an invitation to snakes.

Set up house, in an open place but where it will receive some shade during the hottest part of the afternoon. It should be at least 6 ft. from any bush, tree, fence or building. Cats and snakes will also jump. While it is ideal to have the house to face south or southeast, it is more important to have it face a tree with low limbs. When the young birds first leave the house they will fly to the tree instead of the ground, and this will give them some protection until they learn to fly well.

I have never found it necessary or desirable to provide food for bluebirds during the nesting season. There are plenty of insects at that time of the year and their own foraging will give the birds a better balanced diet than suet and peanut butter. However, fresh, clean water for drinking and bathing is a must. A bird bath on a pedestal is best and the water should be changed every day.

Watch out for wasps. They like to build their nests in birdhouses and have been known to sting the mother bird to death. Do not spray with insecticide. Several times I have used the garden hose to evict wasps. If their nest is destroyed they will seldom return to the same place.

Bluebirds will often nest a second time in the same house if it is cleaned out as soon as the first brood leaves. Usually removing the old nest and brushing out the house is all that is necessary. If soap and water is used be sure to rinse well and use no disinfectants. Constructing the house with a side door makes cleaning much easier.

Something else to watch out for is insecticides. They are certain death to bluebirds. Even though the bird is not sprayed directly, one day's ration of poisoned insects is enough to finish him off. So if these poisons are to be used it is no kindness to attract bluebirds by putting up nesting boxes.

My greatest problem has always been English sparrows. These little birds begin their nesting activities about two or three weeks earlier than do bluebirds, and they will occupy every available nesting site before the bluebirds get started. The only solution I have found is to clean out the sparrow trash at least once a day until the bluebirds move in, after which they will keep the sparrows away.

Around this part of the country bluebirds begin hunting nesting sites during the last week of March, so it is well to have their houses set up and ready by then. Prefabricated houses are available and not too expensive, but they are so easy to build yourself. You need not be a first class carpenter. The birds couldn't care less what the house looks like and there are many things more important than a fancy house. MRS. ELIZABETH B. FROHLICH, ELIZABETH CITY.

Can You Help?

Dear Sir:

In our search for costume material for one of our forthcoming shows, we were advised that full deerskins are available from your department for the asking. We hope this rumor is a true fact. Our budget is limited and our need is great.

It was also suggested the tanned skins may be obtainable either with heads or headless. Our need is for two skins with heads if possible.

We will appreciate your assistance. Please advise us of shipping procedure and costs.

Mrs. E. D. Roscoe
Office Manager
c/o Dept. of Parks and Recreation
1455 South Beretania St.
Honolulu, Hawaii 96814

KNOW YOUR PROTECTOR

Wilton B. Pate

Wildlife Protector Wilton B. Pate, stationed at Aurora, Beaufort County, was born February 26, 1939, in Greene County. Mr. Pate graduated from LaGrange High School. Prior to employment with the Wildlife Resources Commission, Wilton was engaged in farming.

Wilton completed the Pre-Service Training School for Wildlife Protectors at the Institute of Government in Chapel Hill in 1960. He served as Wildlife Protector Trainee in Guilford and Pender Counties. In April of 1961, he was appointed Wildlife Protector and transferred to Aurora. Since his initial employment, he has completed five In-Service Training Schools.

Mr. Pate is an N.R.A. Hunter Safety Instructor, member of the Southeastern Association of Game and Fish Commissioners, Law Enforcement Section, Richland Township Wildlife Club and the Aurora Junior Chamber of Commerce. He is married to the former Linda Hemby of Snow Hill, North Carolina, and they have two daughters, Dale age 6 and Lea Ann age 3. The Pates are members of the Aurora Methodist Church where Mr. Pate serves as a member of the Official Board and teacher of the Senior High Sunday School Class.

DIVISION ENFORCEMENT RECORD FOR JUNE, 1966

HUNTING & FISHING	
Persons checked	46,736
Total prosecutions	810
Total convictions	798
Total cases not guilty	6
Total cases nol prossed	6
Total fines collected	$1,892.25
Total costs collected	$7,039.15
BOATING	
Persons checked	14,515
Total prosecutions	297
Total convictions	286
Total cases not guilty	6
Total cases nol prossed	5
Total fines collected	$ 605.25
Total costs collected	$2,624.80

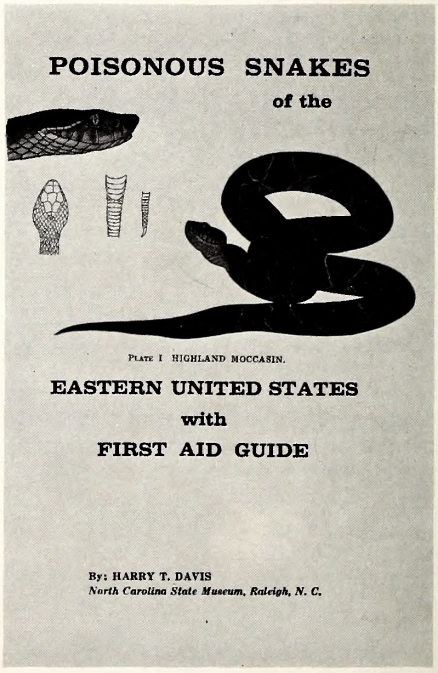
All fines and any arrest or witness fees are paid into the school funds of the counties in which the violations occurred, and no part of the fines or costs collected are paid to the North Carolina Wildlife Resources Commission or its personnel.

Between the *Wildlife* Bookends

CAREERS IN CONSERVATION describes the challenging career opportunities available in conservation today. It gives the specific educational requirements for various occupations, ranging from soil conservation through management of fisheries and wildlife preserves to park development.

Written by nine specialists, each of whom is well qualified to advise on professional preparation for his field, it provides essential information for young people in planning and choosing the right kind of education.

In addition to describing the personal qualifications for the various specialties, the book covers relative degrees of compensation, the work of federal and state agencies, and recent technological advances. Lists of colleges and universities approved by leading conservation organizations are included, together with the fields of specialization offered by each school. $3.75, The Ronald Press Company, 15 East 26th Street, New York, New York.



Authored by long-time State Museum Director Harry T. Davis, this booklet describes and illustrates eight venomous snakes. Send 25 cents to Museum Extension Fund, Box 2281, Raleigh, N. C. 27602.

Baiting

DEAR SIRS: In your April issue of "Wildlife", J. W. Whitside, Jr. of Charlotte asks the question: "Under what conditions is it legal to feed and hunt deer adjoining government reservations?"

Answer: "The law against baiting applies only to game birds."

I believe that it should be pointed out that baiting is illegal "INSIDE" government reservations.

The following was taken from the booklet "Hunting regulations applying to game lands."

"No person shall place or cause to be placed any salt, grain, fruit, or other foods on game lands herein designated unless specifically authorized by an agent of the Wildlife Resources Commission, nor shall any person take or attempt to take game animals attracted to such foods."

I believe this should be clarified before the "Hairy hand of the law" pounces on some unsuspecting fellow baiting for deer in the refuge.

Mack E. Isenhour
Hickory

Bird Traveler

DEAR SIRS: The arrival of my copy of "Wildlife" for July reminded me that I had intended, for the past month to drop you a line or two concerning the cover, and the lovely little bird on it, which graced the June issue.

For the past three years I have seen prothonotary warblers in a swamp near Salisbury; both your cover notes and "Birds of North Carolna" claim them for the eastern part of the state; they're here and for the few of us who have seen them, we're happy about it.

With but few exceptions the members of the warbler family are gems of birdlife, so colorful and vivacious, the prothonotary in my humble opinion, ranks well near the top of the list!

My congratulations to Mr. Dermid on a beautiful shot most attractively presented. MACK OWENS, SALISBURY

CLYDE CRISP

Last October 14, Ruble Dunlap hooked and landed this 8½ pound muskellunge near High Bridge on the Little Tennessee arm of Fontana Reservoir. Nice fish.

SHRIMP

• continued from page 9

webbing and consist of a bag for collecting the catch and wings for guiding the shrimp into the bag. Trawls are held open by boards or "doors" which function in water much as a kite in air. The boards, secured to the trawler by lines, hold the net open and against the bottom when it is pulled through the water. A recent inovation is the use of two smaller trawls (about 40 feet), one on each side of the vessel in place of one larger trawl.

Channel nets are frequently used commercially during spring fishing in Core, Back, and Bogue Sounds. A channel net is a shrimp trawl that is anchored and held open by three or four poles secured to the lead and cork lines. Extra floats keep these nets at the surface. One end is usually secured to an anchored boat; the other end is held in position by a separate anchor. The net is fished by emptying the cod end or bag into a skiff. Channel nets are fished only on ebbing tides during the hours of darkness.

Vessels

Shrimp trawlers range in size from five to seventy tons, and the two types most prevalent in North Carolina are the Florida trawler and the Core Sounder.

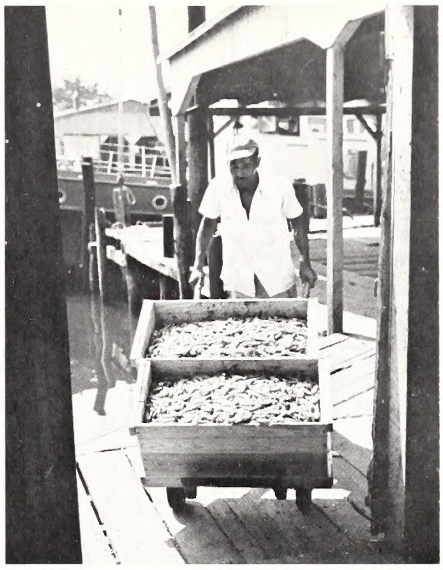
Florida trawlers, which average about 60 feet in length, are usually propelled by about 165 h.p. diesel engines with power take-off winches, and are used for outside fishing. Core Sounders are smaller boats, usually under 40 feet, with a hull designed for the inside waters. They are propelled by gasoline engines of about 100 h.p. and may or may not be equipped with winches. Boats of this type are usually owned by men who operate them.

Seasons

The shrimping season in N. C. usually runs from about mid-May to late fall, and both the beginning and end of the season are markedly influenced by weather.

The three species of shrimp are not caught at exactly the same time of the year because their spawning times are not identical. Spotted shrimp spawn in June and July. The young grow enough to be caught in September, October, and November, but cold weather gradually slows down growth and activity in the fall. Some of these shrimp over-winter in the mud, resume activity in spring when temperatures are suitable, and are usually large and abundant enough to be caught in May.

Brown shrimp spawn in winter and grow to be of commercial size by mid-summer. White shrimp spawn in late winter and spring, and reach commercial size by late summer. White shrimp are fished for almost entirely during the daytime, whereas trawling for the brown and spotted shrimp is conducted at night. ⬍



TRAVEL INFORMATION DIVISION

These fish boxes contain plenty of real fine eating.

ADDRESS CHANGE NOTIFICATION

Name_____

Old Address_____

New Address_____

Zip Code_____

IMPORTANT:
Enclose present Address Label
Please notify us promptly of change of address.

Use this blank to subscribe NOW—$.50 a year
$1.00 for two years. No stamps, please

WILDLIFE IN NORTH CAROLINA New ☐
P. O. Box 2919, Raleigh, N. C. 27602 Renewal ☐

I enclose $_____; send me WILDLIFE IN NORTH CAROLINA for_____years starting with the earliest possible issue.

Name_____

Street or Route_____

City_____State_____Zip Code_____

Please notify us promptly of change in address
If renewal, please send in address label.

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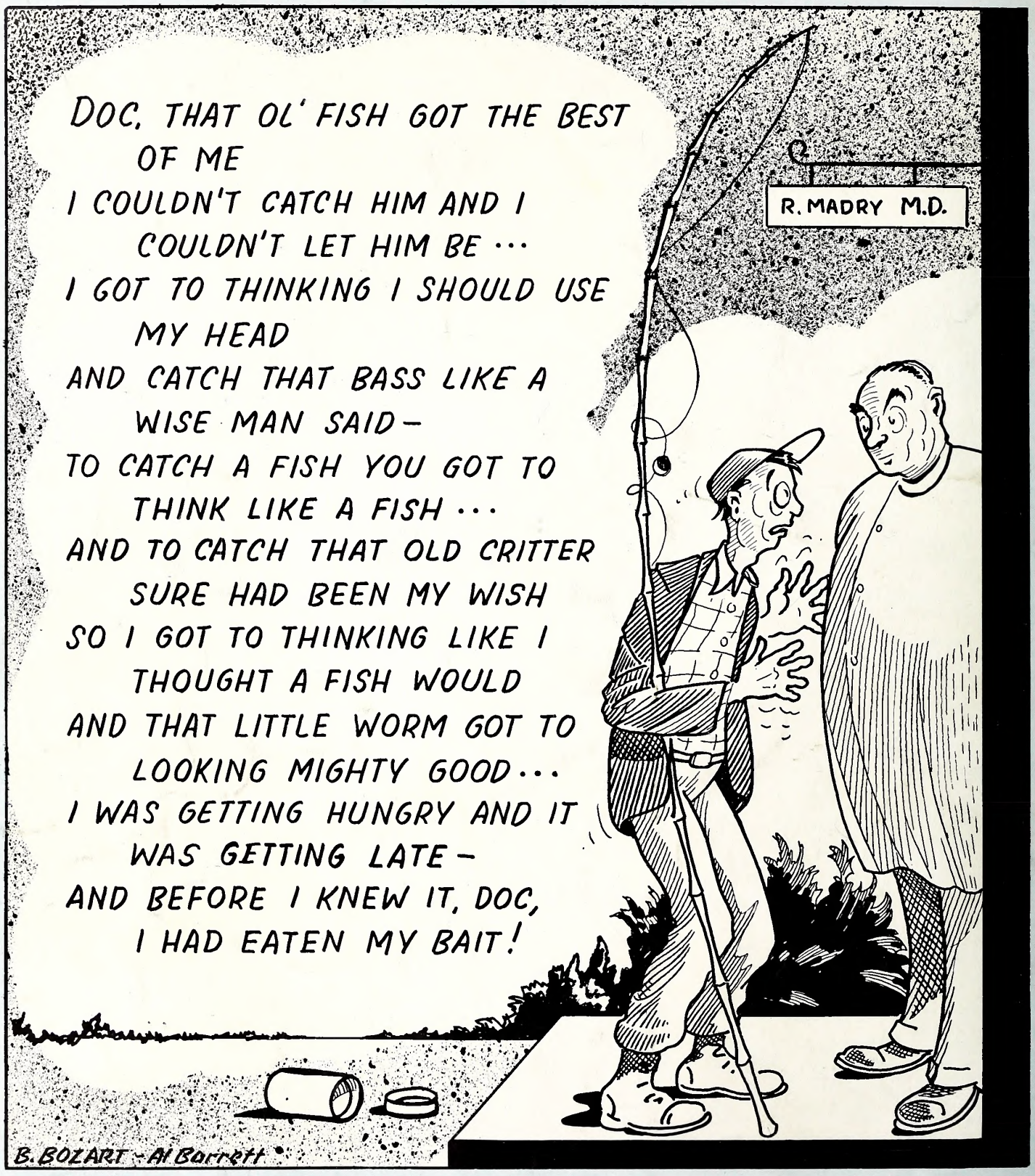
SEPTEMBER MOURN



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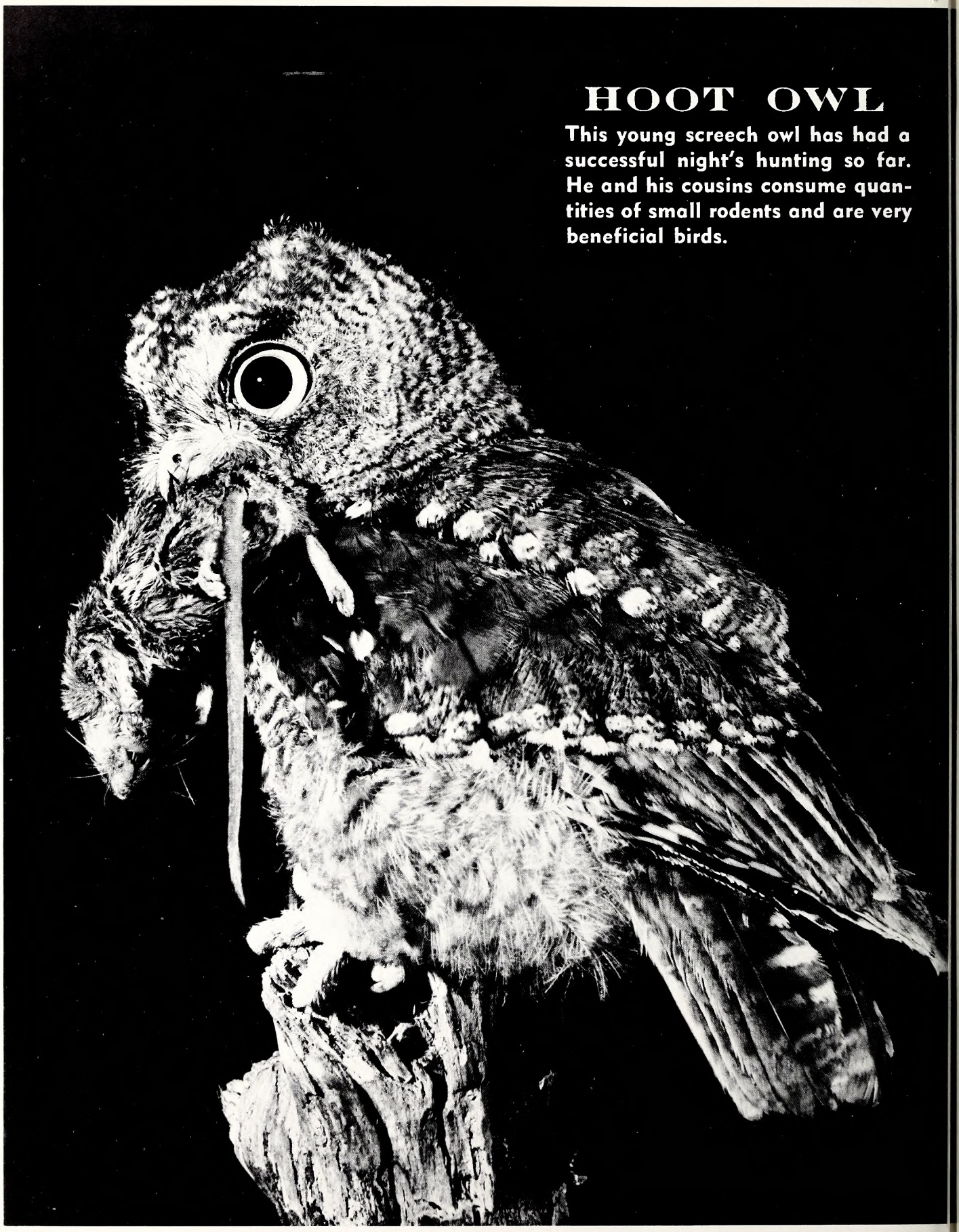
Wildlife IN NORTH CAROLINA

OCTOBER, 1966



HOOT OWL

This young screech owl has had a successful night's hunting so far. He and his cousins consume quantities of small rodents and are very beneficial birds.

PHOTO BY F. EUGENE HESTER

North Carolina State Library
Raleigh

N. C
Do

STATE OF NORTH CAROLINA

DAN K. MOORE
GOVERNOR

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WILDLIFE IN NORTH CAROLINA recognizes the need for close cooperation between State and Federal conservation agencies and the people who hunt and fish—to bring about a restoration of our renewable resources. The Editor gratefully receives for publication news items, articles, and photographs dealing with the North Carolina out-of-doors, but reserves the right to reject materials submitted. Full credit is given for all materials published.

* * *

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* * *

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OCTOBER, 1966 VOL. XXX, NO. 10

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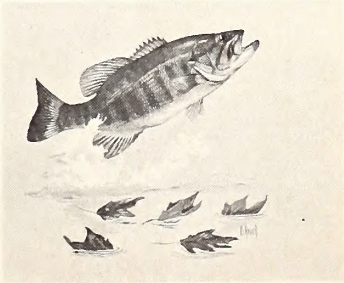

Autumn and smallmouth bass seem to go together. The nip in the air, the splashes of fall color, the cool, clear waters—all form a background for the bronze-green tiger, the smallmouth. Wherever you find him, he'll put up a classic scrap that keeps you coming back for more. Watercolor painting by Duane Raver.

Wildlife Dynamics

by William G. Sheldon
Leader
Massachusetts Cooperative
Wildlife Research Unit

PHOTO BY JOEL ARRINGTON

An Explanation Of The Forces Which Push Wild Game Populations Up, Down, and Sideways.

EVERY hunter knows that game populations change—they are up, down, and in between. While game managers work to improve the habitat so that game animals may live in huntable numbers, part of their job is also keeping track of the population changes. The objective is to make hunting regulations as liberal as possible without jeopardizing the brood stock.

To call our shots on game populations with some confidence requires an array of facts which we refer to as population dynamics. Actually, the information we must gather is basically the same as that tabulated for human populations by the Department of Vital Statistics in Washington. To manage game efficiently we must know the birth rate, the life span, and the survival and death rates of various wildlife species.

Humans, blessed with a liberal life expectancy, often find it difficult to believe the comparatively high reproductivity and annual mortality of wild species. As a rule of thumb, the smaller and more vulnerable a warm-blooded species is, the higher is its productive capacity and the shorter its life expectancy. Many years ago an eminent biologist captured a pair of meadow mice and kept them in an enclosed environment where they bred successfully. The original female produced 17 litters in a year. A daughter from the first litter produced 13 litters the same year. At this rate the population increase becomes astronomical. He calculated that, barring mortality, one million mice could emanate from the original captives in a year.

The pair of robins on your lawn has two nests a year and hatches about eight nestlings in a summer. If it were not for a death rate of almost 60 to 70 percent annually, there would be 42 robins on your lawn a year later and 210 two years later.

Whereas large animals, such as a pair of white-tailed deer, may only double their number in a year, they make up for lower productivity by higher survival. Even so, two pair may produce a herd of 200 in 10 years. As a background for understanding and discussing principles regulating populations of wild species, I shall present certain key information on the production, mortality, survival and death rate of some common game animals.

The annual rhythmic ebb and flow from fall to

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spring in numbers of most wild animals is so great that complete replacement of spring populations is more the rule than the exception. Warm weather each spring ushers in a tremendous new crop of wild species; all must face the hazards of infancy and the rigors of a winter season with shortage of food and suitable living space. The life expectancy of many newborn game or fur animals is less than a year. This is well illustrated by examining the average survival to breeding age of a number of common game species:

Average Survival: Common Game Species

Percent of young that live to breeding age

Species	*Percent*
Pheasant	15
Bobwhite Quail	13
Mallard Duck	32-45
Ruffed Grouse	13-24
Woodcock	20
Cottontail Rabbit	8
Gray Squirrel	35
White-tailed Deer	70

How Many Will There Be In Fall?

The sportsman is chiefly interested in the number surviving to fall after summer has taken its toll. This will vary from region to region and from one year to the next. In good habitat and favorable breeding conditions, average population renewal of common game species is depicted in the following table:

Population Increase From Early Spring to Fall

Adults in spring; numbers in fall

Species	*Spring*	*Fall*
Pheasant	100	200-300
Bobwhite Quail	100	250-350
Mallard Duck	100	130
Ruffed Grouse	100	300-400
Woodcock	100	190
Cottontail Rabbit	100	500-600
Gray Squirrel	100	250
White-tailed Deer	100	140

If the population in the above example is stable, fall numbers will be reduced drastically, leaving 100 breeders alive in the spring.

Let's summarize by examing in the third table the death rates of young from the time of hatching, and of adults, resulting from diseases, predators, hunting, accidents.

Annual Mortality

Species	*Percent Young*	*Percent Adults*
Pheasant	85	40-65
Bobwhite Quail	87	77-82
Mallard Duck	55-68	35-55
Ruffed Grouse	76-87	50-58
Woodcock	80	41
Cottontail Rabbit	92	85
Gray Squirrel	25	?
White-tailed Deer	25	13

The figures and facts presented above were not merely pulled out of the air. They were gathered by wildlife biologists during many years of painstaking research. The basic problem is how do we count or predict wildlife populations when one may catch only fleeting glimpses of these creatures in the field? Some of the techniques developed by biologists to assess the status of wild populations should be of interest.

A few animals can be counted directly. Antelope, mountain sheep, and mountain goats are good examples of big game species inhabiting open land. It is important to get such information as the sex ratio and the number of young. An elaborate technique has been worked out to census waterfowl from airplanes: (1) Broods are counted on representative areas in their breeding grounds; and (2) biologists make an annual winter count of ducks.

Many of the smaller game mammals are counted by repeated live trapping and releasing of marked individuals. Populations can be calculated by the number of marked animals recaptured in successive trapping periods.

Most counts are on a sample basis. Breeding populations of many game birds such as pheasants, ruffed grouse, woodcock, mourning doves and bobwhite quail are assessed by tabulating the number singing, crowing or drumming along representative routes in good habitat. Production and sex ratio can be measured by examining the feather pattern

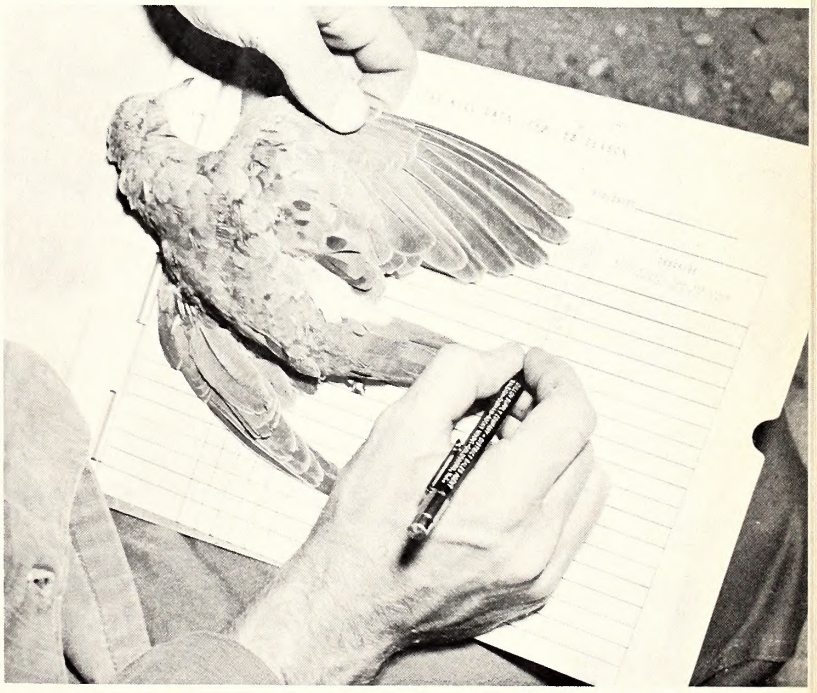


PHOTO BY JACK DERMID

Keeping tabs on dynamic wildlife populations includes checking game for age determination. A dove is examined here.

of wings of ducks, woodcock, bobwhite quail, mourning doves, ruffed grouse and other game birds collected in the fall from hunters' bags.

Many other techniques have been used. One of the most elaborate is that of placing radio transmitters on various species and keep track of daily movements. Drs. John and Frank Craighead shoot grizzly bear with a dart containing a drug which knocks them unconscious temporarily. They mark them, and have placed radio transmitters on a

number in Yellowstone National Park. Their studies have given us very accurate figures on the number of grizzlies using the Park—about 200.

The validity of all our census methods can be accurately measured by employing the tool of statistics.

Principles

There are certain phenomena in wildlife populations which biologists have learned after many years of study.

You cannot stockpile game numbers. The population of animals in any area is directly proportional to the suitability of the habitat. Each land tract will support only certain numbers of different species. We refer to this as "carrying capacity."

If there is high winter survival of any of the smaller game species, high density of numbers may result. By careful studies we know that *density breeds stress, competition for food, cover and territory, plus friction within the members of a species —all resulting in low production and rapidly dwindling numbers. Numbers below the carrying capacity in the spring result in much higher production and rapid restocking of the land.* Nature has built into most species this *power of compensation.* We refer to it sometimes as the law of inversity—the denser the population the lower the production and vice versa. One of the classic studies of this kind was made on muskrats by the late Dr. Paul Errington. This biologist found that muskrat production was good when adequate water and "territory" was available for breeding animals. When drought or other factors caused crowding of the breeders there was fighting, competition for sites, strife of all kinds, and poor production.

A hard winter in Iowa in 1936-37 killed a large part of the quail on a tract of thousands of acres. The spring population was reduced to one quail per 86 acres. Breeding conditions were favorable, however, and by fall the population increased 457 percent.

Some animals require more space than others; whereas, in good habitat, one may expect 256 pheasants per square mile, the same area would support 1,920 cottontail rabbits.

Although failure to take the surplus of small animals by hunting will not affect the species, failure to take the surplus of the large ungulates such as deer, elk or moose can have serious consequences. Not only does an unharvested surplus die of disease or starvation, but the animals destroy their winter ranges by over-browsing vegetation and gradually killing all tree reproduction. Years may be required before the range can recover sufficiently to support a healthy deer population. Not only fewer animals, but lower quality results.

When, for some reason, there is poor production of some species, closing the hunting season has little effect on subsequent recovery. Two of three northern Lake States closed the ruffed grouse season for several seasons to allow the population to "recover." The third state left the season open in the years of sacrcity. Grouse were difficult to bag and many hunters did not go out so that hunting pressure was reduced. Enough brood stock was left for the population to recover just as rapidly in the state with an open season, as in the states where hunting had been prohibited.

Isle Royale National Park in Lake Michigan contained a protected population of moose which soon multiplied to such an extent that heavy winter mortality occurred because of an over-browsed range. Twelve wolves subsequently crossed on the ice to the Isle in a very cold winter and became the progenitors of a small wolf population, 12 to 16 of which have lived there succesfully ever since. During the winter they kill about three moose a week. Biologists on Isle Royale have found that this predation has kept the moose population in balance with its range.

I do not wish to imply that the gun is never the most critical factor in dangerously reducing animal species. Birds such as the whooping crane or California condor are so near extinction that they could be wiped out overnight if not given complete protection. Gregarious species such as many kinds of waterfowl could be seriously decimated if shooting was not carefully regulated.

Guns often are selective of the healthiest animals, whereas predators, such as the wolves on Isle Royale, were found to prey on the oldest or weakest moose, thus ensuring survival of the strongest individual.

Animal Irruptions

There are years when a combination of favorable circumstances produces an "irruption," or tremendous increase in numbers, of certain animals. I have been witness to the lemming migrations to the sea in Norway. While ptarmigan hunting on a plateau in Norway in October, 1945, I was never out of sight of lemmings dead or alive. They were seen from the coast to the highlands in unbelievable numbers. Normally non-migratory, the pressure of numbers caused a mass movement, which was followed by scarcity the following year. In years of high mast production, gray squirrels have been known to exhibit great abundance and similar emigrations. Large numbers have been seen swimming the Mississippi in the fall. In September, 1960, a movement of gray squirrels took place in Massachusetts. On a 60-mile stretch of the Massachusetts Turnpike about 200 road kills were counted during the last week in the month. Squirrels were moving south and appeared on Cape Cod where they are a scarce species.

In such years of game irruptions most individuals are due to die by the following spring. Much potential recreation to hunters is lost unless there is a liberalization of hunting regulations under such circumstances.

Introductions of Animals

If animals are introduced to a favorable environment where none existed before, the build-up of populations is little short of phenomenal. A classic example was an introduction of 24 wild European

• **continued on page 27**

PHOTO BY LUTHER PARTIN

Shooting Preserves

by Luther Partin

Whether it's a fast-flying chukar (left) or a dodging quail, shooting preserve birds can provide some fine sport.

THE income received today by the average wage earner puts him in a position to enjoy many things that were considered to be out of his reach a generation ago. The growing number of sportsmen taking advantage of the the facilities of commercial hunting preserves is a very good example of this situation.

Here is a sport once available primarily to royalty and the wealthy. For the price of a day's wages, or less for many people today, you can shoot native game birds or exotic species that have been introduced from other continents.

The time element receives great priority in most endeavors these days, even hunting. The shooting preserve offers a package that's hard to beat for the man who has to squeeze his hunting in between business appointments or work schedules. The shooting is there, no worry about that. From October through March, you can count on good wing shooting almost every day.

Many people keep one or several bird dogs and only get to hunt a few days out of the year. Preserve shooting can provide the place to hunt, dogs, and birds to shoot, saving this type of hunter considerable time, work, and probably money. Piedmont sportsmen may spend several days, time and wages on a trip to shoot waterfowl, which may or may not put something in the game bag. Right at their back door they may find equally desirable game birds, at much less expense in time and money. Most preserves have facilities for relaxing, changing clothes, refreshments, and overnight lodging can be furnished or arrangeed. If walking is not your long suit, a ride to the shooting fields is usually available.

Preserve operators are licensed by the North Carolina Wildlife Resources Commission. The extended season is permitted if they meet requirements relating to size of preserve and number of birds available for shooting. Shooting fields are inspected and approved by Wildlife Commission personnel, who also check the birds for disease before a permit is issued to operate the preserve.

Bobwhite quail can be shot from October 15-March 31, under the extended season provisions, without regard to sex or bag limits. Wild turkeys could be shot in the same manner; however, no preserve in North Carolina offers turkey hunting to the public. Pheasant, chukar, and other non-native game birds are fair game from October 1-March 31.

With the exception of an occasional wild covey of quail you may find, all the birds are penreared. But don't let that lead you to assume they can't fly. Flying pens keep the birds in good condition. They have plenty of speed, with perhaps less stamina than wild birds. In other words, they probably can't fly as far, but this helps hold them on the preserve, and they may taste better for many people.

Most shooting preserves will have dogs capable of taking honors at field trials. It's almost worth the price of a hunt just to watch a really good dog hunt, point and retrieve. Speaking of price, several systems of charging for hunting are being used by preserve operators. They may use a flat fee, charge for the number of birds released, or sell memberships, with members paying a fixed price for a specified number of hunts or birds. But anyway you slice it, the price revolves around the number of birds involved.

The price for a hunt will vary, depending on whether you are a member and whether you furnish your own dog. The average price for a hunt in North Carolina seems to be in the neighborhood of $25, with the operator furnishing the dog and handler. This is based on eight quail, six chukars, or four pheasants. Extra birds beyond these numbers are usually at a lower rate. Maybe a shooting preserve is the answer to your hunting problem.

Wildlife Preservation in Watershed Projects

PHOTO BY JOEL ARRINGTON

by Edward Ray Smith, Jr.
Soil Conservation Service Biologist

This is Swift Creek at N. C. 118 bridge, showing a clear swathe along the stream. This must be guarded against. The wood duck is one of the first wildlife species to suffer when wet lands are destroyed.

PHOTO BY LUTHER PARTIN

The Story of Little Contentnea

IT'S no secret that wildlife interests have been expressing strong concern the last few years about the impending destruction of swamp wildlife habitat through "improvement" of drainage by watershed projects. But while the first of these drainage projects justified this concern, recent cooperative efforts by state and federal agencies indicate that the total benefit to the people can be considerably increased by preservation of wildlife habitats.

In considering the over-all man to land and weather relationships, several basic principles come into sharp focus. For example, it is clear that since man has not learned to control rainfall he must so adapt his use of the land as to prevent damage to his interests when heavy rains occur.

Flood damage can be prevented or reduced in several ways. First, by conforming to good land use practices, much of the rain can be retained on the land where it falls thus preventing flooding of lowlands. Second, by using lowlands to produce crops which are less subject to destruction by periodic flooding, costly crop losses can be prevented. Third, crop and real estate damage can also be reduced by accelerating removal of flood waters.

LITTLE Contentnea Creek, near Farmville in eastern North Carolina, marks a significant turning point in small watershed projects. On this watershed a more complete recognition of these principles by the local sponsors can be expected to result in increased production of agricultural crops, reduction of damage to real estate, and preservation of valuable wildlife resources.

A torrential rainfall in July of 1962 is what triggered action by the people living in the watershed of Little Contentnea. A single deluge resulted in up to 40% loss of tobacco, cotton and corn —the backbone of the local farm economy. Such rains had occurred in the past but this time alert local representatives of the U. S. Soil Conservation Service pointed out that relief might be provided through the federal Small Watershed Act — more commonly known as PL-566.

Local people responded with alacrity. The required legal organization was formed. In due

course formal application was made, and planning for flood damage prevention was authorized.

The most important part of the plan called for initiation of proper soil conservation practices on the uplands—adapting crops and cropping methods to the lay of the land to provide for optimum water retention. Even before the application was approved, assurances were required that 30% of the farms in the watershed would be under conservation plans. These technical recommendations also indicated optimum land use in lower areas to preclude crops particularly subject to water damage and to specify techniques which would minimize damage.

While proper land use is the backbone of the project, its more spectacular—and expensive—aspect is ditching and diking by use of dragline and other heavy equipment. And this is where conflicts developed in earlier PL 566 projects. Planning engineers were understandably concerned with only one objective—moving the water out as rapidly as possible. To accomplish this, ditches were dug which not only drained the upland crop fields, but valuable swamp wildlife lands as well.

But the people of Contentnea were also interested in wildlife conservation. Having enjoyed good hunting and fishing over the years, they knew its value not only as a source of recreation but also as a relatively untapped economic potential in the form of visiting sportsmen. This is why little Contentnea became the turning point in the impact of watershed development on wildlife resources—its sponsors asked that the project be so designed as to not only prevent flood damage but also to preserve important wetlands for wildlife conservation.

TO accomplish this objective, field crews consisting of representatives of the U. S. Soil Conservation Service, U. S. Fish & Wildlife Service and the North Carolina Wildlife Resources Commission identified and mapped swamp areas important to wildlife—waterfowl, wild turkey, deer, fish and furbearers. *Together* they formulated recommendations for modifying long established engineering procedures to accommodate these resources.

PHOTO BY JIM LEE

Flood waters can be one of Nature's most furious forces. Careful planning is necessary to prevent scenes like this one.

These recommendations included such items as placing and shaping the dragline spoil banks so as to keep water in the swamps during the winter months, making the swamp ditches shallower, and in places substituting a flowpath merely cleared of trees and underbrush. In other locations stream channel deepening was dropped in favor of merely removing from the channel the stems of trees felled by storms and hurricanes, thus expediting the natural flow of water.

The sponsors recognized that while these modifications of engineering design would prevent much of the damage to wildlife habitat, some damage would nevertheless occur. Accordingly they agreed to exercise the wildlife mitigation clause of PL 566 which provides for federal and local cost-sharing of practices designed to affect project-incurred damage to wildlife.

These practices included creating two public fishing lakes to make up for unavoidable loss of stream fishing and planting of dikes with grasses and legumes which would not only help in stabilizing them, but also provide food for wildlife. Another mitigation practice is the installation of control gates in the ditch spoil banks to keep swamp water at optimum levels for production of farm and forest crops—and wildlife.

The people of Little Contentnea are justifiably proud of their plan and have high hopes that it will be approved by federal authorities and implemented in the near future. If other eastern Carolina communities follow Little Contentnea's lead, sportsmen will breathe a deep sigh of relief, and local sponsors and the region as a whole will profit from land use properly adapted to the land and in harmony with the forces of nature.

PHOTO BY TRAVEL INFORMATON DIV.
DEPT. OF CONSERVATION AND DEVELOPMENT

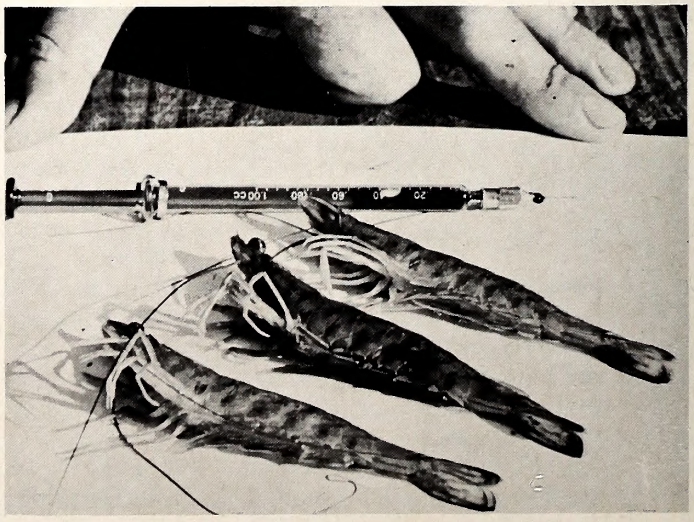
THE N. C. Commercial and Sports Fisheries Research and Development Section has marked and released approximately 10,000 spotted shrimp and 7,000 brown shrimp in Jarrett's Bay and North River, near the Morehead City-Beaufort area of Carteret County. Shrimp were collected, marked, and released five days each week for two, eight-week periods between 25 April and 12 August, 1966.

Constructive research in the field will attempt to learn the answers to such questions as: where do the shrimp migrate after leaving the sounds? What is the rate of mortality due to natural causes? How can man predict the abundance of shrimp for any given season? What is the growth rate of young shrimp?

The shrimp were marked by

Co-author McCoy injects shrimp at dockside. A closeup of the dye-filled syringe and three medium-sized shrimp are pictured at right. Shrimp thus marked are uninjured and free to travel.

COMMERCIAL AND SPORTS FISHERIES DIV. PHOTOS



This is but one of many activities of the Research and Development Section of the Commercial and Sports Fisheries Division. Last month the authors discussed the shrimp and its value to North Carolina economy.

injecting green or blue biological stains (dye) with a small syringe and needle. The green or blue color (primary marks) appears in the gills (on the sides of the head) and is easily detected by shrimp fishermen and headers working in fish houses. The dyes are expected to remain visible for about six to eight months. Secondary marks, consisting of white petroleum jelly and fluorescent pigments injected into the body of shrimp, are used to identify certain size classes each week. Returned shrimp containing the secondary mark provide valuable growth information because the date of release and size at release are known. For this reason, it is of utmost importance that the entire recaptured shrimp be returned.

Approximately 550 of the marked spotted shrimp and 150 of the marked brown shrimp have been recaptured and returned by commercial fishermen and fish house operators. Many of the marked shrimp were recaptured in the ocean between Morehead City and Carolina Beach. The record migration to date was set by a brown shrimp released in North River just northeast of Beaufort, N. C., and recaptured in the ocean five weeks later off Ocean Drive, South Carolina—some 150 miles from the point of release. The record migration to date for a spotted shrimp was one released in North River and recaptured in the ocean five weeks later about 10 miles south of Southport, N. C., or 120 miles from the point of release. None of the marked shrimp has been returned from north of the points of release and a definite southward migration is indicated for both species.

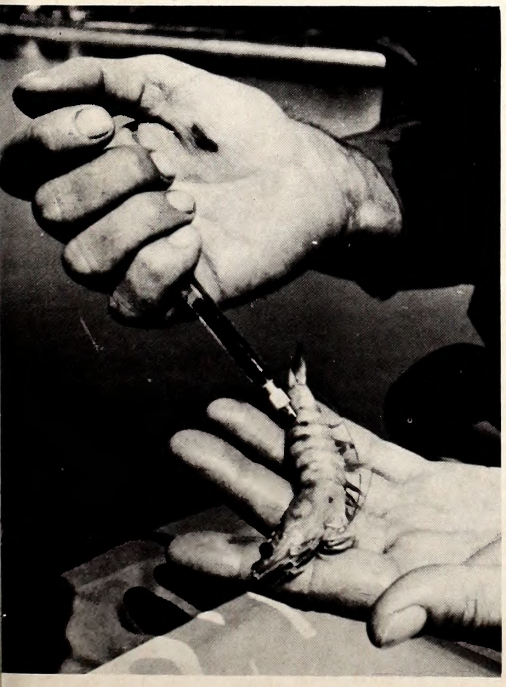
A similar marking program with the white (green tail) shrimp started in late August in the lower Cape Fear River area near Southport, N. C. If the southward migration continues, more of the marked shrimp will be caught along the South Carolina coast and some may be caught along the Georgia and Florida coasts.

The cooperation by commercial fishermen and fish house owners and operators along the North Carolina coast has been excellent. Commercial fisheries state agencies in South Carolina, Georgia, and Florida are assisting in this program. They have received and distributed postors and news releases explaining the program and will assist in returning recaptured shrimp in their areas. Excellent TV and news coverage was extended to the North Carolina program by South Carolina through the efforts of Research Director and Commissioner of Commercial Fisheries Dr. F. Robert Luntz. ⬍

Shrimp Research

by Edward G. McCoy and Michael McKenzie
Biologists
Div. of Commercial and Sports Fisheries
Dept. of Conservation and Development

The delicate operation of injecting the live shrimp is shown here. The stain appears back of the eye on the sides of the head. Biologist McCoy uses a binocular microscope in examining one of the shrimp under study.



One Man's Guns

by Bob Gooch
Photo by the Author

These are the author's "working guns." Left to right, Savage 12-gauge pump, Remington 20-gauge "Sportsman," Remington .22 bolt-action, Marlin .30-30 carbine, and Mossberg .22 magnum "Chuckster." Each has its specific duty to perform.

COLLECTING a practical rack of hunting arms can be fun and even educational; but it can also become a trial and error experiment—still informative, but also expensive! Thorough study and consideration of the anticipated use of each gun should precede its purchase.

My own guns have been assembled over a period of several years. In the process I did a lot of reading, listening and learning, but even at that made a mistake or two that required either the purchase of another gun, or alterations to an incorrect choice.

I would think that my own requirements are not much different from thousands of other gun lovers living in the eastern part of the United States. Geographically you can locate me in the Upper South, Middle Atlantic States, or the East. It doesn't really matter. Game species do not vary a great deal in this general area.

When I am not engaged in making a living, or being a family or community man, the outdoors is my beat. In the course of a year, I like to think that I get in my share of hunting, fishing, camping and boating. Consequently the income I budget for hunting and other outdoor activity has to stretch a long way and this is reflected in my choice of guns. Fortunately today's firearms manufacturers recognize the wide range in financial abilities of gun enthusiasts and collectively produce a good selection of quality guns for those operating on a budget.

My gun rack also reflects the facts that I enjoy all types of hunting, am of medium physical build, and do most of my gunning in populated farming country or on publicly owned game management areas. For reasons of safety I must give a good deal of consideration to the maximum effective range of my guns.

I also lean toward light guns and prefer to place the emphasis on the hunting. In other words, I like to get close to my game rather than depend upon long range accuracy. This too is reflected in my choice of firearms.

As is true in much of the East, the principal big-game animal in my hunting country is the white-tail deer. My area also boasts a small black bear population, and a day's drive will put me in the wild boar mountains. These three species are the major big-game attractions east of the Mississippi.

My choice for big game is the time honored .30-30 and mine happens to be a Marlin 336 Carbine. Most eastern big - game hunting is done in wooded areas and the .30-30 is a good brush gun. It has very limited long range accuracy, but opportunities for long shots are rare in this kind of country—and I like to stalk or wait for my game, anyway.

The .30-30 carbine has withstood the test of time and is rich in tradition. It meets my idiosyncrasy for a light gun, and being short, handles well in the brush. A properly placed expanding bullet packs plenty of punch for our eastern big game, and the ammunition is inexpensive and easy to obtain.

The .30-30 can be fitted with a scope, but for woods hunting I prefer a receiver sight. My Marlin is equipped with a Redfield.

Unfortunately rifles are banned in much of the eastern deer country, but as yet this ban has not spread to my white-tail hangouts. If and when it does, I will be faced with the choice of a shotgun for deer. This may mean a new gun, or possibly one of my present scatterguns will fill the bill.

The wild turkey is a grand big-game bird and hunting it requires highly specialized techniques. The turkey purist calls his

game to the blind. For gun purposes, I group the turkey, ducks, geese and fox. I hunt them with a Savage 12-gauge, pump-action shotgun fitted with a Cutts Compensator, and having a barrel length of 30 inches. This is a fairly heavy gun, but most of this kind of shooting is done from a blind, stand, or boat and weight is not too much of a problem. I normally use either magnum or high-velocity loads.

Turkey hunters seem to be divided between No. 4 and No. 6 size shot, but the unanimous choice of many hunters is No. 6. I like No. 4 for ducks with No. 2 getting the nod for geese.

In my neck of the woods, the fox is reserved for those who mount thoroughbred horses and hunt behind packs of registered hounds. To express it mildly, shooting the fox is "frowned upon", so I rarely engage in fox hunting. If I did I would use the Savage "corn shucker" and No. 2 magnums.

The latest addition to my collection is a Mossberg "Chuckster" .22 magnum. I bought it for woodchucks. It is not as powerful as some of the other varmint favorites, but it can dispose of woodchucks in a workman-like manner. Since I like to stalk woodchucks, I have never called upon it for a shot beyond 125 yards. Fitted with a 4 power scope, it's accurate and effective at that range. For woodchucks and other varmints such as bobcats, and crows, I recommend hollow point bullets.

The "Chuckster" is the only one of my guns to which I have added a sling. It's an asset for the longer range shots where steadiness is so important.

The .22 magnum should also be a good turkey gun for those who prefer a rifle over the scattergun.

The work horse in my battery of hunting arms is a Remington "Sportsman", 20-gauge automatic. Its 26 inch barrel is bored improved cylinder. I bought it several years ago from an office supply salesman who called on my office. Rather foolishly. he had given up hunting. It could not have fitted me better if I had ordered it custom made. It swings like a dream on fast moving upland game.

Some hunters would consider this little gun too light for some of the jobs I call upon it for. I feel, however, that any power I sacrifice is compensated for by the ease and speed with which I can get off a string of three fast shots.

It starts the hunting year with me in September, when doves start circling the cornfields. I use No. 7½ high-velocity loads and let the birds get within reasonable range. Dove hunters, armed with modified or full choke 12-gauge scatterguns, insist I am undergunned, but I feel that so long as I keep the range limitations of the gun in mind, I'll stay in business.

From the dove fields the little 20 is switched to the marshes for clapper rails and sora. I oil it heavily for protection from the salt water of the clapper marshes and load it with light loads of No. 8 or 9 shot.

The same combination will put woodcocks in the game bag.

Once the upland game season opens, the little 20 gets double duty—tumbling rabbits in front of my beagles, picking quail from exploding coveys, and slamming away at grouse flushed from the evergreen ridges. For quail I use regular No. 8 shot, but change to high-velocity No. 6's for rabbits and grouse. The extra powder is probably unnecessary for cottontails, but the wallop does no harm, and I like the added punch for an occasional pot shot at a scampering squirrel.

While I do very little pheasant or chukar hunting on shooting preserves, the 20-gauge is my choice when I do get the opportunity to go after these wonderful game birds. I find No. 6 shot adequate.

At this point I have described four guns—two shotguns and two rifles. A quick glance at the accompanying chart will show that I am armed for all kinds of eastern hunting. If I wanted to be completely practical, I could stop at this point.

I have a real weakness though: it's hunting squirrels with a scoped .22. If I could engage in only one form of hunting, it would be still-hunting these little rodents with a .22. Squirrels are fairly abundant everywhere, can be hunted in a variety of ways and

• **continued on page 26**

Gun — Game — Ammuntion

Gun	*Game*	*Ammunition*
Remington Sportsman 20-gauge shotgun with 26" improved cylinder barrel	Rabbit, quail, grouse, doves, rails, chukar, pheasant, squirrels, woodcock	No. 8 and 9, No. 6 Magnum and No. 7½ high-velocity
Savage pump-action, 12-gauge shotgun with 30" full-choke barrel	Geese, ducks, turkeys, fox and crows	No. 2, 4 and 6 Magnum
Marlin .30-30 Carbine	Bear, deer and wild boar	Expanding bullets
Mossberg "Chuckster" .22 Magnum with 4X scope	Woodchucks, bobcats, crows, turkeys and fox	Hollow Point bullets
Remington bolt-action .22 rifle with 4X scope	Squirrels	Hollow Point bullets

N. C. MIGRATORY GAME REGULATIONS 1966-67*

Species	Open Seasons Dates Inclusive	Shooting Hours	Daily Bag	Possession Limit
Dove	Sept. 7 - Oct. 12 Dec. 10 - Jan. 12	12:00 Noon to Sunset	12	24
Rails, Sora and Gallinules	Sept. 1 - Nov. 9	Sunrise to Sunset	15	30
Woodcock	Nov. 19 - Jan. 7	Sunrise to Sunset	5	10
Wilson's Snipe	Nov. 19 - Jan. 7	One-half hour before Sunrise to Sunset	8	16
Geese(1)	Nov. 7 - Jan. 14	One-half hour before Sunrise to Sunset	2	4
Brant	Nov. 7 - Jan. 14	One-half hour before Sunrise to Sunset	6	6
Ducks	Nov. 14 - Jan. 7	One-half hour before Sunrise to Sunset	3(2)(6)	6(3)
Coot	Nov. 14 - Jan. 7	One-half hour before Sunrise to Sunset	10	20
Hooded, American or Red-breasted Merganser	Nov. 14 - Jan. 7	One-half hour before Sunrise to Sunset	5(4)	10(5)

(1) Closed season on snow geese.

(2) May not include more than 2 wood ducks, or 2 canvasbacks.

(3) May not include more than 4 wood ducks, or 4 canvasbacks.

(4) May not include more than 1 hooded merganser.

(5) May not include more than 2 hooded mergansers.

(6) A bonus daily bag limit of 2 and possession limit of 4 scaup and ring-necked ducks will be permitted in addition to the regular bag and possession limits on ducks in coastal waters designated as commercial fishing waters east of U. S. Highway No. 17, except that this bonus will not be allowed in Core Sound between Drum Inlet and Harkers Island, in Pamlico River upstream and west of a line between Pungo River and Goose Creek, and in Currituck Sound north of U. S. Highway No. 158.

*Regulations for non-migratory game are available from Hunting and Fishing License Agents.

Visitors Are Coming

by Lunette Barber

VISITORS are coming, winging our way by the thousands. The birds are returning as usual; but there is always the renewed excitement for two groups in autumn —the hunter and the bird watcher. The sportsman will center his attention on the Canada goose, black duck, mallard, canvasback, and many of the others on the hunting list. Of course the mourning dove and wood duck are those that are here all the time, but migratory also. They just move around at their own will seasonally. It is hoped that after the Migratory Waterfowl Stamp has been purchased there will be enough birds for the sportsman to take his share legally and to thrill to the sport of hunting along with his dog, and enjoy the duck dinners, too. For he is the one who foots most of the bill when it comes to protection of wildlife. Too few people realize how important the sportsman's dollar is for the protection of wildlife—and that goes for is conservation in other lands besides the United States—the Pacific Northwest, Alaska, Mexico, and Africa, for instance.

The bird watcher can be thrilled at all times in North Carolina. Not only is it Variety Vacationland for Tarheels and tourists, but because of the difference in elevation (from sea level to 6,684 feet), a distance of 503 miles from the eastern part of the state to the western, the topography, and Atlantic flyway, it is Variety Vacationland for the birds too. More than 410 birds have been listed in the state—a real variety.

Some of those remaining throughout the year are the mockingbird, cardinal, meadowlark, bluebird, vultures, owls, some hawks, woodpeckers, phoebe, chickadee, tufted titmouse, nuthatch, kingfisher, bluejay, Carolina wren, and crow. There are some birds that remain but move around the state during the year namely robin, junco, and lovely song sparrow.

The bird lovers are sorry to see the long list of summer tourists leave. Perhaps the family leaving and taking most of its members is the insect-eating warblers. Others to be missed are the ruby-throated hummingbird, the chimney swift, the purple martin, the goatsuckers (whip-poor-will, night-hawk, and chuck-wills-widow), orchard and Baltimore orioles, the yellow-billed and black-billed cuckoos, scarlet and summer tanagers, many of the swallows and vireos.

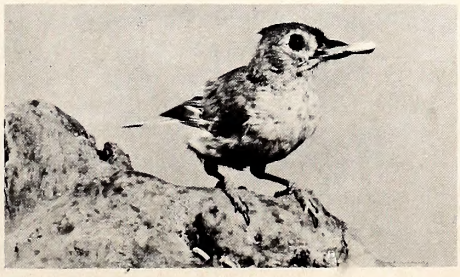
The bird watcher's thrill will be when the winter residents return. Perhaps birds get more attention and are enjoyed more at that time because people spend more time at home and are participating in fewer activities away from home. The vacancy left by the summer visitors will be partially filled by the hermit thrush, pippit, cedar waxwing, pine siskin, purple finch, white-throated and fox sparrows, myrtle warbler, winter wren, golden-crowned, and ruby-crowned kinglets and evening grosbeaks.

How do we know where the birds go? Bird banding has revealed many facts. Many of our songbirds and game birds—especially waterfowl—may be wearing bands on their legs. Should you find or obtain one of these bands, send it to Patuxent Research Refuge, Bird Banding Office, Maryland, and also tell how, when and where the band was obtained. The information about the bird will come back to you and will give you a better insight of the mystery and facts of migration. That is your part and the way you can help with the program.

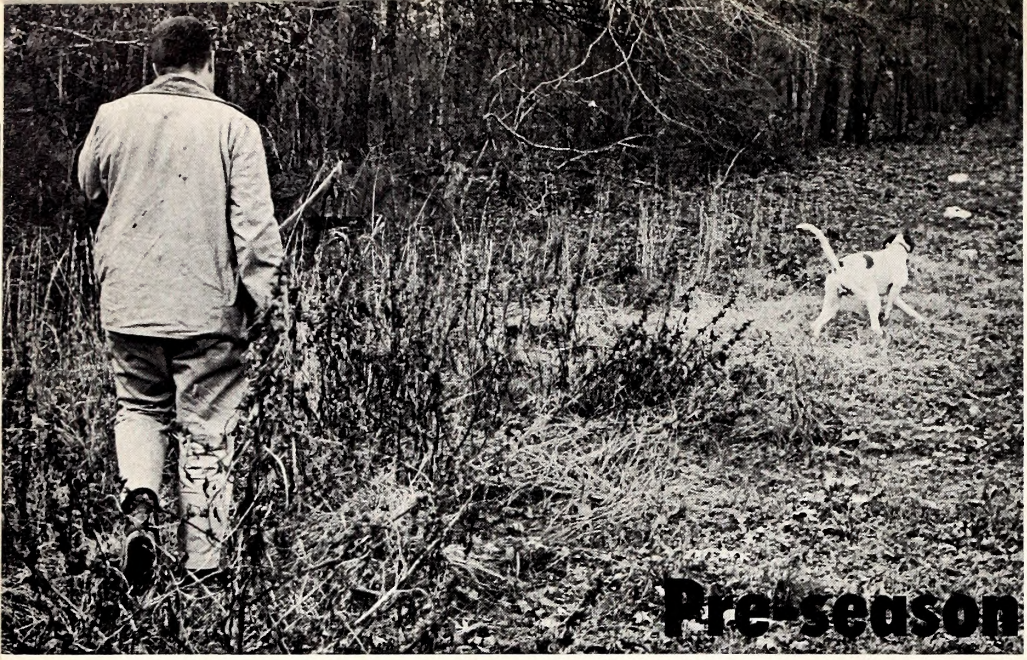
Each one can have a part to keep the birds going and coming too. Birds need food, homes, and protection just as man does. In order to provide these, the first requirement is to know the bird. Then it will take continued interest, education and work to hang out the welcome sign in their behalf. North Carolina can be and should be a continued favorite spot for birds. Let's have a NO VACANCY sign at all seasons and make the bird tourist business the best in order to please the sportsman and aesthetic admirer.

ROBINS

TUFTED TITMOUSE



CARDINAL



Pre-season Scouting

by Frank Mooney

PHOTOS BY JOEL ARRINGTON

PRE-SEASON jaunts can pay big dividends in adding to your hunting pleasure along with more game in the bag. Hunters that rush into the season without any preparation or foresight can often spend the first few days of each season without bagging their quarry plus experiencing some miserable and useless hardships. Upland game, or migratory birds for that matter, can shift their feeding grounds and roosting area from one season to another, and without running a preseason check the hunter largely drops his trip into the lap of lady luck. And in my experience lady luck is a poor companion without first having some knowledge of the animal's habitat or the terrain that you intend to hunt.

Food and cover are the basic essentials that any animal needs to reproduce and flourish. So any time you find good cover and food that a certain animal desires, you can bet the critter frequents the place. Most animals are creatures of habit, so naturally you can count on a covey of quail, a big buck, or flock of wood ducks using the same place year after year as long as the conditions are ideal or the game isn't molested unmercifully. But with the shifting of cover or food, the animals that are dependent upon them will, of course, migrate to greener pastures.

One quail season several years ago, a friend and I decided to hunt an area about 30 miles from home because the quail were so abundant the past season. Too late we learned that most of the land that had been resting the past season with a bountiful crop of grain and cover was now under cultivation and the birds had migrated to adjoining farms and woodlots to find the basic requirements. We spent a fruitless day, tired and with a lean game bag because we had not used enough foresight to take a preseason trip.

Get Ready

A good conditioner is to exercise your dog several weeks prior to bird season; by doing this one can have three things going at once for him. First, he can locate the quail and learn more about their range; second, he can get the dog in shape physically plus getting that keen nose back into practice; and third, he can get himself toughtened up because the average hunter laden with heavy hunting boots, hunting coat, and shells with a 6½ to 7½-pound gun to carry can tell a few hours after the season opens whether or not those preseason trips paid off. Remember, be sure to get permission from the landowner before running your dogs before season.

A day before the 1965-66 waterfowl season I burned a tank of gas in my outboard motor checking and trying to locate the feeding areas of ducks on a large lake near home. The following morning I was in a well-concealed blind with the decoys bobbing gently on the rippling water. Ten minutes after legal shooting time I had my limit of ducks and was ready to pick up blocks and head for the car. Without this bit of planning I probably would have spent the entire day to get my limit. Another hunter that failed to check the ducks' activities spent a fruitless day without firing a shot, and he was only several hundred yards from my position.

Many hunters fail to realize the importance of locating the ducks' feeding grounds. The novice will find a secluded spot, pitch out the blocks, and blow their lungs out trying to coax a flock of reluctant puddlers or river ducks to their stool. Ducks that are familiar with the area will not decoy to a strange place because they have their own feeding places. If you don't find these places, your efforts are wasted, unless they happen to fly over you while traveling to their destination. Ducks that are migrating and passing through the area will sometimes decoy to a spot not used by the local ducks; but the chances are slim even for

this. For positive results, know where the ducks are.

Deer Tail

I located an excellent deer crossing several years ago and killed three deer using the same route during two seasons. The following season I confidently thought of the crossing in anticipation of bagging a trophy whitetail as the grayness gave way to the noise of the daylight creatures of the forest. I left my car in the pre-dawn light and tried not disturb any late feeding deer as I slowly trod to my stand. Hopefully, I settled down to await the legal shooting time when I was sure a huge buck would come following the trail of a soft-eyed doe or eluding some hunter that was out to nail his rack to their wall.

Too late I learned the deer had moved their crossing about 75 yards to the west of the path that had been used for the previous three seasons. Several deer crossed below me that day using the same path. I could hear the rustling of the leaves and the redbird's nervous chatter as the critters slipped passed me; but due to the dense foliage, I was unable to see anything. Late that evening after some observing I found the well-worn path with tracks and droppings to verify it. You guessed it; the next day I was watching the crossing like a hungry hawk watches a rat hole with a new outlook on deer's habits. However, I failed to get a shot due to no deer movement while I was there. For some unknown reason the deer had changed their crossing only 75 yards; but without pre-season scouting it caused me to miss out on a possible kill in that area. I killed a deer that season but it took two weeks of hard sweat and loss of sleep to put venison on the table.

Pre-season scouting can help locate bedding areas and trails that deer use when traveling back and forth from feeding grounds to bedding grounds. Often when watching a trail a patient gunner can bag his prize as a late sleeper slips passed him. Deer activity is not limited to nighttime as many hunters think. On certain days these animals move some throughout the day. I have seen deer moving around at mid-day, undisturbed, traveling at a leisurely pace.

If you've missed out checking your favorite spot before the season, take time out to glass the landscape, or ask someone who has made an investigation trip. It will pay off. These hunters are scanning woodchuck country before starting out.

Farmer Friends

It pays off in less time and trouble to drop by and chat with the farmer on whose land you anticipate hunting when the season opens. During a Sunday drive, call on the farmer and get permission to hunt and possibly learn where the most game is congregating this year, which crops are planted where, etc. If the farmer for some reason does not allow any hunting on his land, it may be that he can give you some names of his neighbors that might allow hunting.

For good dove shooting it is necessary to find a grain field or some area that these feathered missiles are using frequently. Riding country roads and watching for farms that have silos is one of the best methods to find dove country. These farmers usually cut silage or harvest some grain prior to dove season and these speed demons flock in by the hundreds from miles around to feed on their favorite food. Usually these are the only open fields where food is abundant. Also, pre-season scouting for watering holes and resting places can often give some fast action when feeding areas are not nearby.

When pursuing the tricky bushy tail, a pre-season trip is mandatory to assure good shooting. Trees that bear heavy crops of mast vary from one season to another; one season the trees are laden with nuts, then another year and only a scattering of nuts can be seen hanging from the trees. Squirrels will travel a great distance when food is scarce in their home territory. I have had some good shooting in old grown-up fields where a scattering of nut trees grew among the pines to yield a heavy crop of nuts, and the nut crackers would swarm out of the big woods to gorge on this precious supply. During one of these sessions, the lucky hunter can get the bore of his trusty rifle to the heating point.

Only a few hours before any season can often be well spent by asking some local people and doing a little checking to get some idea where the food and cover are located for the species of game that you intend to hunt. On these trips I am always a little more relaxed and this, also, serves as a great opportunity to enjoy the scenery in its natural state while whetting your appetite for the coming season.

Recreation "Chiefs" May Ignore Experienced

Conservation Indians

by Ernest Swift
National Wildlife Federation

TODAY Recreation is the most resplendent rose on the thorny brush of conservation, even though many present-day recreational programs are considerably off-center with true resource management fundamentals. But right now recreation is top-dog, and so new bureaus have been created, bigger budgets allocated, endless and overlapping planning committees, both voluntary and statutory, have sprung to arms, and there is a constant lather of recreaton meetings, training schools, workshops ad infinitum.

The voices of many new prophets are now echoing from the mountain tops with sermons of salvation. Many of these new and untried voices represent new jobs and fancy salaries, and to justify their existence there is need for them to throw their weight around and wear the mantle of profundity.

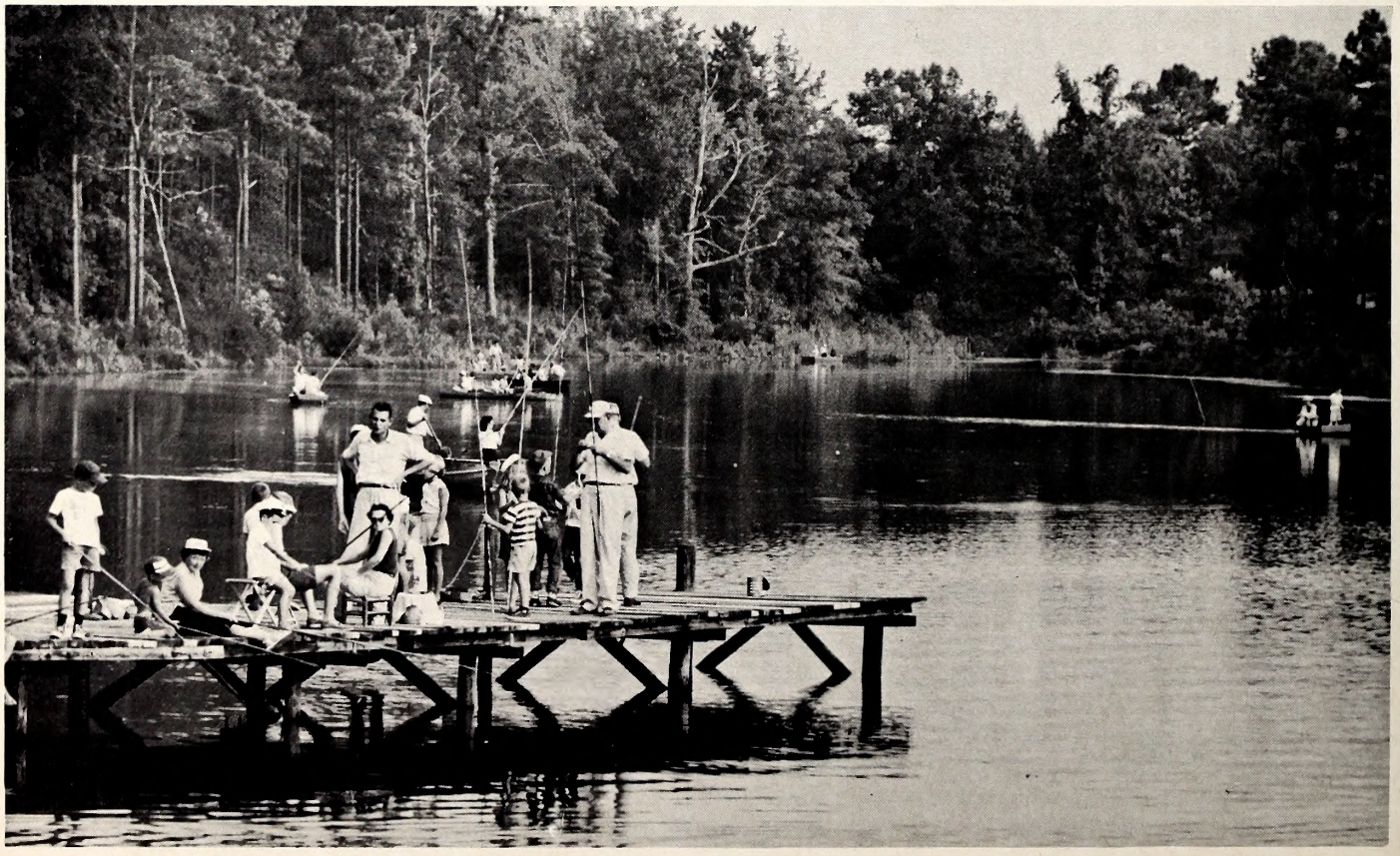
But this new crop of Chiefs have had little association with the poor Indians who, lo these many years, have been carrying on the unromantic field work and daily chores. Some Chiefs hardly know the Indians exist, although these peasants are supposed to execute any and all of the grandiose recreation plans now forthcoming.

I learned a long time ago that anything of value to be accomplished for conservation must be in the field and on the land, and that planning sessions are not an end in themselves but only an imperfect means to an end. Otherwise they are a waste of time and money.

It has become apparent to me that the education of some of the Chiefs I have listened to has been sadly neglected. They have never fought a forest fire, run a compass line, manned a tower or planted a tree. They have never frozen their hands or their bottoms spawning fish, nor taken a turn at stream improvement, nor developed a watershed, never lain out all night to catch a deer shiner, beaver trapper or spring duck hunter, never looked down the muzzle of a gun while attempting to uphold the sovereignty of their state or the Federal government, never felt the acrimony of a defense attorney

What are the answers to more people and the same amount of fishing waters? Or more hunters and perhaps even less hunting territory? The field man may have many of the answers.

PHOTO BY JACK DERMID



or the indifference of a jury, and never, day in and day out, weathered the ignorance of public opinion.

DURING all this high and mighty planning, propaganda and oratory, these doers of deeds—these plain, hard-working public employees of the hinterlands and rural communities who have dedicated their life to a cause because they believed in it —for the time being at least are being forgotten and neglected. Not only are they forgotten and neglected, but their years of individual and collective experience is not wanted.

Suddenly they fail to grasp the "Big Picture." Their practical experience has stunted their growth and imagination. They are guilty of being interested only in resources and protecting them from public onslaught. They lack the sympathy and vision necessary to wet-nurse people en masse, many of whom are interested only in taking all they can get for free, giving back nothing to conservation in time, effort, or money.

I remember back in 1936 when a backwoods sizzorbill set a fire one morning to get the job of putting it out, and by nightfall over twenty thousand acres of second growth jackpine had burned. It had to be patrolled for weeks. A small fortune was spent to control it, and a lot of shoe leather was burned.

I also well recall the many fall seasons I worked attempting to handle several thousand wild-eyed deer hunters in my country, and once of coming home long after dark to find my parlor full of hunters, with mud and tobacco ashes on the carpet and my wife in tears. Some wanted to buy deer. Another knew where there were two illegal deer in the woods and would drag them out if I would give him one. Another wanted to buy a bear. Another had lost his partner and expected me to start right out to find him. And lastly there was the citizen who deemed the game regulations all wrong and had stopped by to pass on his great wealth of knowledge.

All this for $120 a month, $65 for expenses and furnish my own car. Do field men get anti-social or just realistic? Some of the newly arisen Chiefs with the chamber of commerce complex should work the field for about ten years and come back with the answers on social responsibility.

IT is time that we blow the foam off some of this effervescent planning and find out how much substance there is underneath, and who all these years has been doing the work and guarding the resources.

Wildlife officers and rangers still have to fight for equipment and travel money, but there is always money for planning committees. Irresponsible juries still turn law violators loose, and some judges and district attorneys consider it smart politics to down-grade conservation laws. Fisheries biologists and other field men still report pollution violations, the illegal filling of lake shores, the destruction of spawning beds, and ofttimes

Some pretty strong statements? Maybe, but the author calls them as he sees them. Our situation in North Carolina so far is good, and the relationship between the planners and the field force is a solid one. But it could happen here.

receive only token backing from their head office or other constituted authority. Too often word comes back from the Capital not to "rock the boat," and not to wear righteous indignation as a chevron.

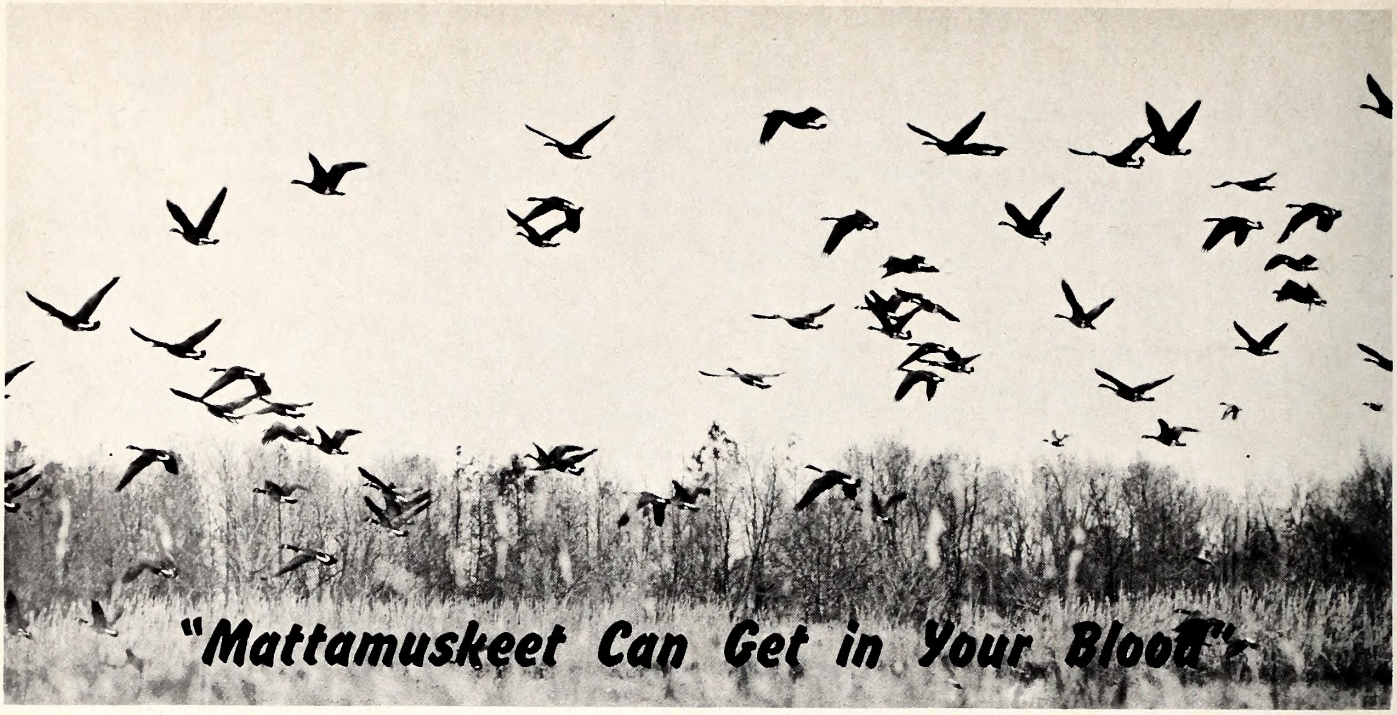
It takes a mighty ornery and rugged public servant to buck such a current. But many are doing it, and so they get themselves in trouble because of their convictions and because some local politician or group of business men don't want the sins of the community made public. "Going by the book" in the field sometimes gets the director of the department in hot water—possibly a director who wants to ride out his tenure with no big political "blow-up."

Well do I realize that there must be planning, but it must be realistic and for a purpose, and field men should be consulted, whatever their specialty. Their counsel should be sought, their evidence weighed, their ideas of practical application analyzed. Conservation is learned in the field, not by talking from a podium. Through experience judgment is developed.

The proof of the pudding is in the field—it always has been and it always will be. There is where the work is done. There is where success or failure is measured. There is where the sweat, heartaches and physical risks occur. There is where all conservation will ultimately be accomplished if there is going to be any conservation of natural resources.

Armchair planners simply can't work out practical measures to do the job of recreational development. The sooner they begin relying on the field force, the quicker results will be seen.

PHOTO BY JACK DERMID



"Mattamuskeet Can Get in Your Blood"

PHOTO BY JACK DERMID

SEVERAL years ago a group of hunters from the Catawba Wildlife Club, Hickory, North Carolina, planned a goose hunting trip to Lake Mattamuskeet. I was the far away member, living in Toledo, Ohio. We are all avid hunters having hunted in various parts of the United States and Canada for game that ranged from ducks to moose.

This was to be a trip to shoot the "Honkers." Reservations were made for blinds, by Phil Bracewell. We were very fortunate in being able to stay at the home of Mrs. Hodges on the southwest side of the lake. She has a reputation for serving the finest meals in this area. We all agreed that as a cook and gracious hostess she is unsurpassed.

Two days before the opening of the season we assembled at Mattamuskeet and toured the area. It was the dark of the moon and we found thousands of geese on the lake. At dusk the geese flew off the lake into the local fields. We were really fired with enthusiasm after seeing these clouds of birds.

The evening before the big day to start shooting we met at the headquarters of Speedy Tunnell, Refuge Manager, to punch the board for our blinds. Each man paid $6.00 plus the price of his blind permit. We were hunting four to a blind. My group drew Number 11 blind with guide Arlen Swindell.

We all met at 5:00 a.m. and went to our blind by boat. Arlen soon had the goose decoys set out in front and about 18 duck decoys at the side. Our guide brought along his beautiful Labrador retriever which sat on a small platform at the door of the blind. At the moment of shooting time we heard geese honking from all directions. Five big ones were coming toward us and with a few excellent calls from Swindell, they came and settled among our decoys. We were lucky because we shot the five and the dog soon brought them in.

The time spent in getting these geese had been very short and we needed only three more to fill our bag. We soon had them and were on our way back to Mrs. Hodges by 9:00 a.m. She welcomed us with hot coffee and pie just from the oven.

Mattamuskeet not only offers the finest in goose hunting but also excellent deer hunting, and quail hunting. Every day can be exciting regardless of what form of hunting the sportsman chooses. We became well acquainted with Speedy Tunnell and his lovely wife as well as with others of the Wildlife Commission personnel. All were splendid and eager for the hunter to have an excellent shoot. These casual friendships have grown through the years and we all have a deep personal feeling for our friends at Mattamuskeet. Each year we plan the next hunt with the same enthusiasm as the very first. When December 1st arrives we are impatient to take off for our "Happy Hunting Ground."

I know of no place to enjoy hunting experiences such as Mattamuskeet offers and I'll guarantee that anyone planning a trip to shoot the wily goose will fall under the same spell that we did.

Last season's goose hunting at Mattamuskeet wasn't up to par; and needless to say, the Wildlife Commission heard about it. But here is one letter that eased the pain a bit. Glenn L. Roberts of Toledo, Ohio, and his party, enjoyed themselves. Let's hope more hunters have more sport this season.

NORTH CAROLINA WILDLIFE

RESOURCE-O-GRAM

A ROUNDUP OF THE LATEST WILDLIFE NEWS

State Fair To Feature Live Wildlife

The North Carolina State Fair this year will feature living specimens of the state's more interesting wild animals. A planned feature of this year's Wildlife Resources Commission exhibit will be a live, wild alligator. The Commission's exhibit will be sheltered under a big tent to the westward of the Arena, and is expected to attract thousands of visitors who can enjoy the exhibit without charge. Several state officials believe that the Commission's wildlife exhibit could form the nucleus of a state-sponsored zoo.

Waterfowl Seasons Announced

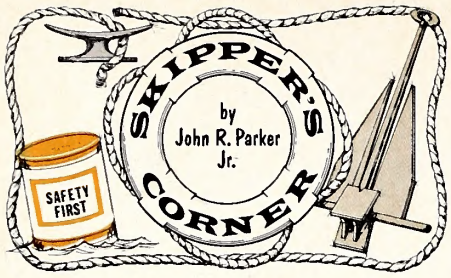
The hunting season for Tarheel waterfowl is scheduled to get under way one-half hour before sunrise on November 7 when the season on geese opens. The goose season will continue through January 14. The season on ducks will get under way half an hour before sunrise on November 14 and continue through January 7. Shooting hours will be the same as for geese. Bag limit for geese will be 2 daily, 4 in possession, no snow geese allowed. In general, the daily bag limit of ducks will be 3 with 6 allowed in possession. There are exceptions to the 3 and 6 bag limit on ducks, and waterfowl hunters would do well to read federal regulations given with each migratory waterfowl stamp purchased at local post offices. A synopsis is printed on page 14 of this issue.

October Sees Beginning of Big Game Seasons

Saturday, October 14, marks the beginning of the 1966-1967 hunting season for big game. On the list of Tarheel big game species are deer, bear, and European wild boar. With numerous exceptions, the big game season in North Carolina runs from October 14 through January 2. Complete information on hunting for big game and smaller game species is available from hunting license dealers or from the Wildlife Resources Commission, Raleigh.

Late Trout Season

Designated mountain trout waters will be open to trout fishing until October 31, except those on wildlife management areas. Trout anglers participating in after-Labor Day angling may use only single-hook artificial lures, and must return unharmed to the water all fish except for one trophy-size fish that may be retained. The size limit on this fish is 16 inches.



SOMEWHERE on an eastern North Carolina stream a small boat glides to a stop beside a vine laden with wild grapes. It is midmorning. The boat operator, a fisherman, has been fairly successful as the bass are once again on top. Now another harvest is about to take place.

Further east, and a few hours earlier, one of a party of three play-out flat lines behind an offshore size runabout. He thinks as he snaps the reel into gear, "the blues will be larger now; the season is changing."

On a Piedmont lake, a day cruiser with a family aboard reduces speed as it rounds a point of land. The reason takes the form of a dozen or so pairs of wings. The family watches the small flock of blue-winged teal lift from the water and start another day of flying on a southerly course. The early migrants have arrived.

Fall returns to North Carolina. With it, many will follow the habit of storing their rig until spring. The boaters described above, however, are extending their boating and will enjoy the pleasures to be found on the water in the weeks ahead.

There are, no doubt, reasons other than the ones described that tempt a certain portion of North Carolina's boaters to keep the tanks topped during the fall months. Perhaps the lack of boat traffic beckons some. Still others will use their boat for hunting as the season wears on. Fishing we have mentioned and some will do this until the blossoms appear. Some folks just never quit.

Boat camping? Why not? And fall is as good a time as any. A camp or cooking fire will now be less uncomfortable to gather around; and coffee may be the beverage rather than cold drinks.

What about fall boating? Conditions are usually about the same as they were during the summer months. But there are a few differences—not of the least importance is the weather. Yes, the summer squalls are waning, something every boater looks forward to. There will still be storms, some severe, so keep in mind that a weather eye is needed. Remember too that the fall winds may cause a different side of the lake to be rough now. Those in small boats should be especially mindful of wind force and direction.

The fall boater need not act too differently than he did a few weeks ago, but this depends on the body of water and how far into the fall or winter months he extends his boating. Continuing along with the traffic factor mentioned, we must remember that one has less help in time of need when there are fewer boats out. But on the other hand, there is less chance of colliding with another boat, a leading cause of boating accidents.

Further, boat accidents drop to only a few a month in the fall and winter. But don't become overconfident because of this; accidents usually drop off as traffic decreases.

So you may be out there all alone; better remind yourself doubly of the basic safety practices. Since the hot weather won't be driving you from the water early in the day, better take extra fuel. You may get the urge to cruise further than originally planned.

How about the cooler weather? At mid-day there may be little practical difference in temperature, but fall mornings and evenings have an unmistable nip that calls for wind breakers and sweaters. Later on, heavier clothing will be needed.

The standard personal items such as sun glasses, rain gear, etc. are still needed. Sun tan lotions are good especially if you have one aboard who stayed in the office all summer. Don't forget the boat shoes with non-skid soles. They are as important in the fall as in the summer. Because the water is cooling, it would now be even rougher to go over the side.

Standard equipment is still needed aboard the boat. The life preserver for each person aboard, first aid kit, anchor and line, bailing device, etc. are all considered standard equipment, not extra. If you decreased your boat outings during the heat of August, better check now to see that certain items have not been left in the garage or basement.

What about the boat? You probably ran her hard this past summer. Better give spark plugs, gasoline filter, and lower unit grease, to name a few, a thorough checking. And the boat trailer, don't forget it. If you wore a tire slick this past summer, better replace it before the new season, the fall season we are talking about. Trailer wheel bearings can be real trouble makers too, especially if you have dunked them in coastal waters. Repacking and adjusting these would be time well spent. Give the hull and fittings a once over also.

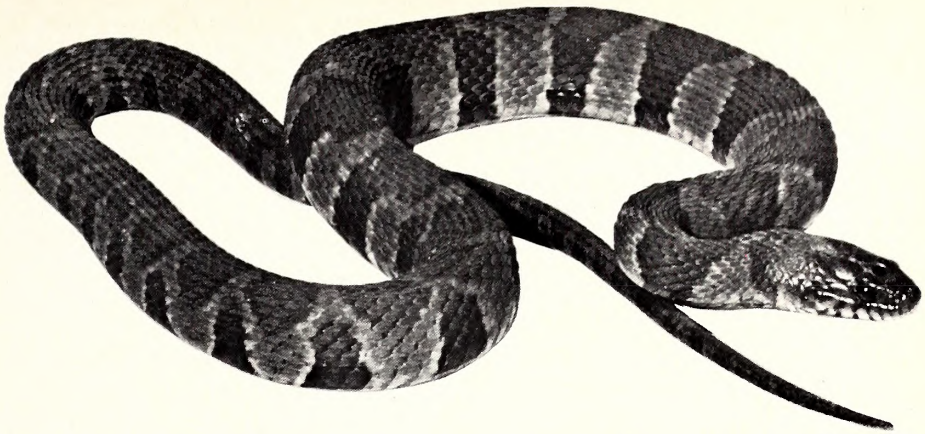
In some few cases, late fall may find boating facilities closed or with shortened hours. Plan accordingly to prevent the need for last minute purchases.

As fall changes the schedule of many, so may the shorter days of fall require changes in your cruise schedules. Don't get caught after dark unprepared. If you do plan to cruise after sunset, be sure running lights are working. Reduce speed and keep a very close watch.

You may wish to pick up a new chart. Who knows where this fall's cruise will lead you. Try new waters; they may become a favorite for next summer.

You say a skier just went by wearing a rubber suit and ear muffs? Well, we didn't say you would have it completely to yourself. But then there is ample room for all. And the color and crispness of fall offers certain pleasures not offered by those lazy days of summer.

The Northern Water Snake



by
Franklin F. Snelson, Jr. and William M. Palmer
Cornell University and N. C. State Museum

Photo by Joel Arrington

IT is doubtful if any species of harmless snake is more often unjustly persecuted than is the northern water snake, *Natrix sipedon sipedon.* Fishermen and other enthusiasts of aquatic recreation seldom ignore the opportunity to kill these creatures on sight. erroneously believing that by doing so a dangerous pest and inveterate destroyer of game fish populations is eliminated. The well known and most inappropriate common name of "water moccasin" reflects the animosity with which most people regard this species. (Actually this ambiguous term often is indescriminately applied to just about all snakes observed in or around water).

Unfortunately the northern water snake does somewhat resemble the dangerous cottonmouth and the two species occasionally are found together in the same habitat. The harmless speces, however, lacks the pit between the eye and the nostril; the scales on the underside of the tail are in two rows and do not appear as undivided plates; and the water snake does not vibrate the tail when molested as does the cottonmouth (Many other harmless snakes do vibrate the tail).

The northern water snake is characterized by a background color of some shade of brown or sometimes reddish with darker markings composed of crossbands on the forward portion of the body and blotches posteriorly. The underside is yellowish with small dark or reddish half moon-shaped spots either arranged in a regular fashion or randomly scattered over the belly. The typical pattern may be obscure or nearly obliterated in large adults, especially if the snakes have been out of water for any period of time. Such specimens may prove exceptionally difficult to identify until examined closely. The pattern usually becomes evident on even the largest individuals when the snake is placed in water. This common species is among the largest of the water snakes and occasionally may exceed four feet in length. Average adults, however, measure 2½ - 3 feet.

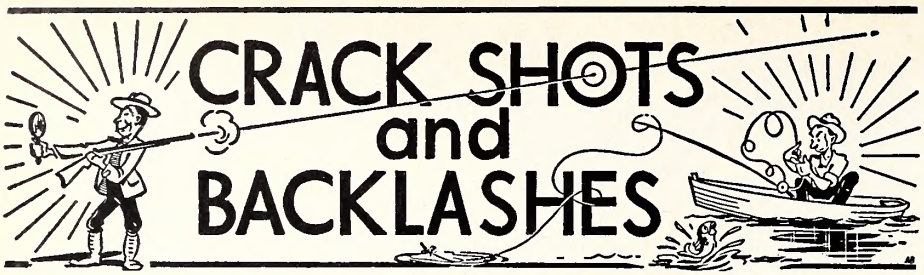
The northern water snake ranges throughout most of the northeast, south to North Carolina and Tennessee and the northern portions of Alabama and Georgia. The distribution extends westward to eastern Colorado. The species in North Carolina occurs primarily in the Piedmont and in the Mountains up to at least 3500 feet. In the Coastal Plain it is found abundantly in the western portion; in those counties north of Albemarle Sound; and in salt or brackish water situations at least as far south as Carteret County.

Favorite habitats are streams, rivers, lakes, and farm ponds. Specimens are often found beneath rocks, logs, and similar cover either in or very near the water. On warm sunny days individuals may frequently be seen coiled among the branches of shrubs and small trees overhanging the water. During the summer months water snakes are most commonly observed prowling about the water's edge at night.

When captured these snakes are quick to defend themselves by biting and extruding the malodorous musk so characteristic of the genus. The bite of adult specimens produces lacerations which may bleed rather profusely but, other than the infrequent chance of infection which accompanies any scratch or cut, should be treated no differently than any other minor skin wound.

Mating occurs in the spring when several males may attempt to court a single female. During the late summer a female northern water snake may give birth to as many as 40 or more young, each 7-8 inches in length.

The food is composed mainly of amphibians and fishes with small turtles sometimes being included in the diet. Recent studies have shown that this water snake is among the most beneficial predators occurring in aquatic habitats. It is of prime importance in controlling fish populations and preventing small specimens from completely dominating a lake or pond. Without adequate predation such water would become over-populated with stunted fish undesirable for angling purposes, and those fish of respectable size would through extensive competition be eliminated. In addition, water snakes are extremely prolific and their young are relished by such predatory game fish as bass and pickerel. For these reasons it might be well to actually encourage the presence of water snakes about lakes and farm ponds.



DEPARTMENT OF LETTERS TO THE EDITORS, FIELD NOTES, AND ITEMS OF INTEREST

Conducted By Rod Amundson

Very often we hear about various species of wildlife standing near the point of extinction. This is true, of course, of such species as whooping cranes, bald eagles, California condors and so on.

But in spite of the tremendous urban and industrial growth made in the past few decades here in North Carolina, there are several game species whose populations go far beyond the demand by hunters. One example of these is the marsh hens—rails and gallinules. This year the federal government has allowed another long season on these birds, and a daily bag of 15 with 30 allowed in possession. Yet when the season opened last September 1, it is doubtful if more than two dozen hunters took to the salt marshes for marsh hen hunting.

Although this may seem surprising, there are several good reasons for this. First, the tides were not high enough. To hunt marsh hens successfully, you need a shallow-draft skiff and someone to pole it over the marsh. To do this requires a tide of at least five feet. Secondly, marsh hens are hard to flush from the rank marsh vegetation, and once flushed, are hard to hit. Their flight is slow compared to a duck or a dove, but it is extremely erratic.

Once a bird is downed, it is usually hard to locate. Unless you take a good retriever along, you will find yourself wading through deep mud and water, and on occasion will find yourself up to your neck in a slough. The weather is usually hot during the first part of the season; mosquitoes are abundant, tides do not always occur during daylight hours, and you will have to remove the salt water from your shotgun at the end of the hunt.

Marsh hens are abundant, and will remain that way until our marshes have been filled in to make room for progress.

Ruffed grouse are another species that far exceeds the demand by hunters. Grouse occur only in the mountainous section of the state, and considerable stamina is required on the part of the hunter to bag them successfully. They are denizens of heavy woodland and brushy areas, and the time between flushing the birds and their disappearance into the woods is very brief indeed.

While marsh hens and grouse have remained abundant, several species of ducks have been on the danger list, notably canvasbacks and redheads. Duck hunters can take some encouragement from a longer season this year, and the shooting hours increased from sunrise to sunset to half an hour before sunrise to sunset.

This is grouse country, Tarheel style. This hunting is rough and ready, but scarcely touched by the hunter. This is one bird that could be harvested in greater numbers and still continue to maintain good populations. It's no sport for the road hunter.

PHOTO BY JOEL ARRINGTON

Road Hunting

DEAR SIRS: During the past few years I have seen increasing numbers of men (and boys) using high powered rifles for hunting deer in the wooded areas near Wilmington in New Hanover and Pender counties. One teen age boy had an old army-type 30 calibre rifle and he was sitting on the shoulder of the highway not far from Hampstead. He was a participant in a deer drive. There was a residence not more than 200 yards from where he was located, and other houses nearby in the area. If a deer had crossed I am sure that he would have fired with probably no thought being given to the houses or to cars that might have been passing. It seems to me that some strict regulations are going to have to be put into effect or some people are going to get killed in the next few years with rifle bullets.

I was an Army Reserve Officer for more than 30 years, so I know what a rifle bullet can do and how far it can travel with lethal results. I don't object to hunting or to the right of a person to have a gun. What I do object to is being endangered by people carrying high powered rifles and using them in thickly populated areas. I would favor a prohibition on the use of rifles in flat coastal areas where there are residences. I

also think that no one should be allowed to hunt with a high powered rifle until he has passed a test and received a certificate showing that he knows how to use the rifle and is familiar with its dangerous potential.

I would like to have your views on this matter.

Name withheld by request.

Dear Sir:

The use of the rifle for deer hunting is apparently on the increase, as you have indicated. Presently, there is not a statewide law prohibiting the use of a rifle (or other sporting arms) from the most popular deer stand, the highway and secondary road right-of-way. Certain counties do have local laws prohibiting it however. If a law is further pursued to any extent, it probably should be considered from a state-wide basis. This would help the hunter and the law enforcement officer because there would be no question as to the legality of the right-of-way hunting stand.

Agreed, it is most disconcerting when one thinks of what could happen to a motorist driving along, or a person living near an area frequented by rifle-carrying hunters. But what's to keep a stray bullet from spinning through the window as I write this? The same thing, we would hope, that has lowered the number of hunting accident fatalities last season by about 30 percent; gun handling knowhow and, of course, lady luck. Also we would point out that about 80 percent of the hunting accidents involve the old scattergun.

Admittedly, the highway is not a safe place from which to discharge any sporting arm. And we would not endorse any type of careless gun handling or situation that would tend to increase accident potential. However, we can say that seldom, if ever, is a hunting accident reported resulting from the road-hunting situation.

WILDLIFE IN NORTH CAROLINA acknowledges the good that could come from having all young hunters receive gun handling training. This is why the Wildlife Resources Commission has for six years administered a joint program with the National Rifle Association. Should such training be mandatory? This question will have to be decided by the people of the State. Some states have taken steps requiring hunter safety training prior to hunting license purchase but, we should add, they still have accidents. John Parker, Outdoor Safety Officer.

PHOTO BY JOHN PARKER

Boys and guns are bound to come together sooner or later. Hunter safety training for youngsters should eliminate much careless gun handling.

Colorful Snakes

DEAR SIRS: I have been taking WILDLIFE Magazine for three years. This letter concerns the page you see each month on the discription and life history of a snake. I am 14 years of age and have been a Boy Scout for three years. In scouts I have learned how to handle snakes and how *not* to handle them. Boy Scouts know what color a snake is but the ordinary public doesn't. You put a very good description of the snakes in the article but I think that if the picture of the snake was in color the description would be far more clear and beneficial. JIM LOCKE

● As much as we would like to run all of our pictures in full color, our budget would not allow it. At a subscription rate of only 50 cents per year we must economize as much as possible.—Ed.

Bluebirds, Snakes And Gourds

DEAR SIRS:

Two men from North Carolina have written to me and told me how to keep the snakes away from my bluebirds. Their instructions were the same and by following these instructions I have saved the first hatching and now have the second one underway. Thank you gentlemen for your help. My blue birds still like gourds better than boxes. A man in Ohio saw this statement in my first letter and wrote to me to send him some gourd seed. I referred him to a seed house in Nashville, Tennessee, and I hope he is now in the gourd business, A. HOYT MILLER, ATLANTA, GEORGIA

Dilemma

DEAR SIRS: Recently I found a baby rabbit about two or three weeks old that was injured by some kittens. They had somehow taken the skin off his back in a strip about 2 or 3 inches wide and 3 inches long. There was absolutely no fur at all in this area. I was very concerned and wanted to help him if possible, so I called several drugstores and any other places, such as Forest Service to find what sort of treatment would be most helpful.

I was advised to go ahead and put the little fellow out of his misery. I didn't think this the thing to do, so after some deliberation with friends, we decided to put him out where there was plenty of green food and to coat his back with vaseline.

Now, this is my question: If such an incident should ever happen again, what treatment should be rendered without causing too much pain and with the best chance of survival?

Any consideration you will give this question will be most appreciated. I love to hunt and enjoyed your article on women hunters and fishers in last month's issue. JUDY WAITS, GREENVILLE

● Cottontail rabbits rarely thrive in captivity. As to treatment of this type of wound, your veterinarian should be of some help.—Ed.

Nail on the Head

DEAR SIRS: The sport of hunting is not as it used to be. The modern hunter, as never before, is faced with the problem of no game.

In the past, a hunter could enter the field with certainty of killing enough for the night's meal. Game was plentiful in those days. The "old-timers" still remember "how it used to be."

Today a hunter may spend an entire afternoon in the field and never flush a covey of quail.

Dogs of today are a prize possession. A well-trained dog may mean the difference between a full quota

KNOW YOUR PROTECTOR

Walter Don Augustine

Mr. Walter Don Augustine, son of Mr. & Mrs. W. F. Augustine, was born in Pender County in 1941. He graduated from Burgaw High School in 1958. He was employed as Supervisor at Carlisle Poultry & Egg Company in Burgaw.

In June, 1964, Mr. Augustine attended the Pre-Service Training School at the Institute of Government in Chapel Hill, North Carolina, and was employed as a Wildlife Protector Trainee in Dunn, North Carolina, October 1, 1965. He was promoted to Wildlife Protector in February, 1966, and transferred to Pittsboro, North Carolina. He attended the In-Service Training School in February, 1966.

Mr. Augustine is married to the former Mary Lee Rivenbark of Burgaw. They have one child, Walter Lee. All are members of the Long Creek Baptist Church.

DIVISION ENFORCEMENT RECORD FOR JULY, 1966

HUNTING & FISHING	
Persons checked	31,306
Total prosecutions	927
Total convictions	908
Total cases not guilty	1
Total cases nol prossed	17
Total fines collected	$2,923.75
Total costs collected	$7,930.85
BOATING	
Persons checked	12,527
Total prosecutions	517
Total convictions	505
Total cases not guilty	6
Total cases nol prossed	6
Total fines collected	$ 907.90
Total costs collected	$4,847.00

All fines and any arrest or witness fees are paid into the school funds of the counties in which the violations occurred, and *no part of the fines or costs collected are paid to the North Carolina Wildlife Resources Commission or its personnel.*

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of quail and no quail at all. However, the "old-timer" may remark, "As good as your dog is, he will never be the equal of my Napoleon." True, the "old-timer" may have killed five times as many birds over his dog, but, in his day, there were ten times as many birds as are afforded the modern hunter.

Much less cover is present today also. Where fields of oats and barley were sixty years ago, shopping centers and highways are growing today. Cover and food are the key to a good crop of game.

More work in conservation is needed. With our help, the future for our sons' hunting may be prosperous and plentiful. MIKE McARTHUR, (16) WILSON

Well Done

DEAR SIR: Recently I was invited to the town of Kernersville, North Carolina to observe the fine work being done by one of its young citizens, Mr. Brad Mullinax, who is also a Scout leader in the local Flaming Arrow Patrol Troop 940, of the Main Street Methodist Church, Kernersville, N. C.

Young Mullinax has undertaken an extensive project on his own initiative, which entails a feeding program for squirrels, and other wildlife. With the approval of the board of aldermen, a hickory tree planting program was started, this will serve a two-fold purpose, preventing erosion along a watershed area, and provide feed for squirrels later.

Brad also has built several feeders, which greatly aided the winter feeding problem for wildlife, and also planted sun flower seed in several areas.

Brad Mullinax

It is the earnest hope of Scout Mullinax, that these various projects will enable him to qualify for the Hornaday Award.

Wallace W. Jones
Winston-Salem

Thank-you Note

DEAR SIRS: My age is 11, I just started taking **Wildlife** this year. The articles are very interesting and pictures plentiful. I especially enjoy "Crackshots and Backlashes." The covers are very colorful and eye-catching. Your magazine is a big help in school. The pictures are very useful in booklets and school projects. Lots of teachers take it and enjoy it. How you print it and sell it for the price you do is unbelievable. Please, keep up the good work. BLACKIE FOX, NEW BERN

MAN'S GUNS

• **continued from page 13**

require shooting skill and woodsmanship. For engaging in this favorite sport, I own a Remington bolt-action, mounted with a 4 X Weaver scope.

I prefer long-rifle hollow point bullets. They kill quickly and humanely.

The above collection of guns breaks down into five appropriate game groups, as outlined in the accompanying chart.

My collection of guns might well be labeled "basic" for eastern hunting. Naturally when so few guns are called upon for such a wide variety of hunting, some compromises are inevitable. They do not seriously handicap the hunter, however, and lack of hunting success can usually be traced to some cause other than the firearm.

There is also room for flexibility. The Remington .22, for example, can be used for woodchucks up to 50 yards. And some skilled riflemen prefer the .22 for cottontails, where terrain permits.

The 12-gauge can also do some of the work I assign to the little 20. While I seldom do so, it's easy to swap the full-choke tube

for the modified one, and use the heavier gun for doves, grouse and pheasants. Some nimrods like the additional range and power for these game birds. Another possibility is to exchange the modified-choke tube for a full tube and get some extra range for geese.

For the most part the single species hunter would not be satisfied with my choice for his favorite game. The quail hunter, for instance, would probably insist upon adding a fine double-barreled scattergun to his collection. And the dedicated woodchuck hunter would probably not settle for less than two additional varmint rifles, one certainly in the high velocity class.

Even the poor guy "bitten by many hunting bugs", can make refinements as the seasons come and go and the pocketbook permits.

That's part of the fun.

PHOTO BY JOHN R. PARKER, JR.

The White Oak River Waterfowl Impoundment will offer more duck hunting this fall. This 100-acre impoundment, located in Onslow County, can be reached only by boat. Launch adjacent to secondary road bridge at Stella and proceed downstream. A Season Small Game Permit, $3.00, is required. (See, "More Duck Hunting," November, '64 and "Waterfowl Hunting On Salt Marsh Impoundments," December, '65, Wildlife In North Carolina, for project details.

DYNAMICS

• continued from page 6

rabbits in Australia in 1859. In six years they increased to 30,000, and 10 years later Australia exported 700 million rabbit skins and 157 million frozen carcasses. In 1927, three dozen pheasants were released on Pelee Island in Ontario. Seven years later the island was yielding an annual harvest to hunters of 10,000 birds, or a bird per acre and later even more. [The starling is an example of the danger in introducing exotic species.—Editor.]

Conclusion

The response of animal populations to natural mortality is explosive enough to restock coverts from one year to the next. There is, however, no substitute for destroyed habitat. As the living space of wild species is chewed up by the bull-dozer, and wider highways span the continent to provide transportation for our burgeoning human population, wild species will diminish unless we husband at least a patchwork of wild land. Let's face it. We, the sportsmen, the naturalists, the conservationsts, can preserve the heritage of hunting, fishing and all types of outdoor recreation only by not squandering wild lands. All regional planning should provide an environment where wild species can thrive. Give our animals the room; they have the capacity to populate it!

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PHOTO BY LUTHER PARTIN

Greenwings

And what beautiful creations they are! These are but two of the extensive collection of Clarence Nordstrom, Raleigh. The pair of green-winged teal represent hours of painstaking work of Lem Ward, Chrisfield, Maryland. Mr. Ward is considered the dean of decoy makers in America.

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Wildlife IN NORTH CAROLINA

NOVEMBER, 1966

Restless

When we think of North American waterfowl, the majestic Canada goose is certain to come to mind. The big gray birds are here now, stitching the leaden skies with seams of restless lines.

STATE OF NORTH CAROLINA

DAN K. MOORE
GOVERNOR

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WILDLIFE IN NORTH CAROLINA recognizes the need for close cooperation between State and Federal conservation agencies and the people who hunt and fish—to bring about a restoration of our renewable resources. The Editor gratefully receives for publication news items, articles, and photographs dealing with the North Carolina out-of-doors, but reserves the right to reject materials submitted. Full credit is given for all materials published.

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NOVEMBER, 1966 VOL. XXX, NO. 11

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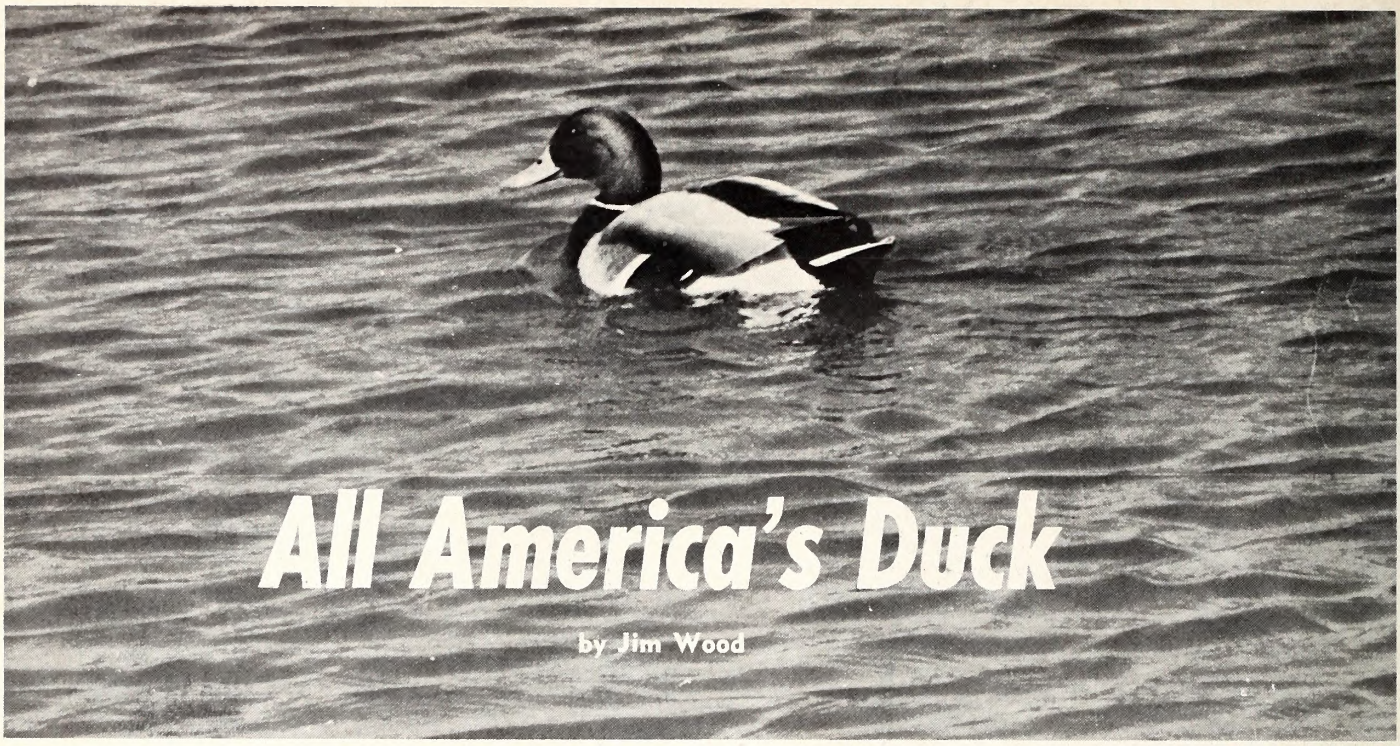
JOHN PARKER - - - - - OUTDOOR SAFETY
TOM JACKSON - - WRITER-PHOTOGRAPHER

The magic hour for the goose hunter has finally arrived; shooting time is here. Yet the scene is almost too lovely to disturb with gun fire. As the sun peeps over the horizon, the sky is tinted with delicate colors that constantly change. The high-pitched honk of geese pierces the dawn stillness, as two distant flocks head out to feed. Photo by F. Eugene Hester.



All America's Duck

by Jim Wood

PHOTO BY LUTHER PARTIN

THEY come, often as late as they can wait before starting the southward trek, for this is a duck who likes to stay home until the ice makes skin on the water before he moves on. But as surely as the sun comes to morning he'll come in the days cut short by autumn, in long bunched flocks scrapping with the winds or sometimes just a few, the sun flecking on green heads in the late days, and gold off the backs of the drab hens, the youngsters particularly often still in scraggly plumage. Across the mountains and falling into valleys that funnel the waters of the rivers, with a stirring within them that drives them on, even they not knowing why, but only that they must follow it.

Black swift wings fanning against skies painted with golds that a painter will never know, and the most velvet of violets, that only "He With The Magic Brush" could manage, skies that few mortals see with any constancy unless he happens to follow the sea or the air, or toils on the land for a livlihood. The ancestral nest is far behind where the icy bitterness is now on the waters, the home that spring caused him to seek not long before for the peace of a too short summer. But it has been a long summer for us who wait for him to come back, and it's a delight to see him once more.

Many call him simply "the wild duck" but since a vast number of ducks are wild, and many wilder than he, this doesn't satisfy somehow. Some of my friends call him "Old Greenhead" and this is somewhat better. In the broad Louisiana bayou country he is called by many the French duck, and in other spots only the female is singled out for special nomenclature, the gray duck or the gray mallard she's often called.

Whatever you call him he's quite a marvelous bird and to those concerned with less cluttering up of waterfowl terminology, he remains just mallard. Wild duck might be quite all right if used within confined boundaries, but as the old hunter told me some years ago in a place I've since found he is always called mallard, "Hugh, they're all wild around here, son", with a breath of awe when he started talking about ducks. An awful lot of people have no identification skill when it comes to wild fowl, but few fail to recognize the iridescent beauty of the mallard drake, sparks flying when he turns his green head in the sun, his rich chestnutty vest a sight to see. He has just got so famous that he's seldom able to go incognito.

It's quite safe to say that the mallard is the most important of all waterfowl in this nation, and quite possibly, even of the world. From his handsome feathers sprang all the domesticated ducks known to man with the single exception of the old, red-wattled muscovy, and the duck raising business for the markets not of small consequence. Since duck roasted to magnificence was one of man's first delicacies, it's easy to understand why the mallard was tamed as early as the Roman Empire, and the Chinese have raised ducks in an assembly line manner for centuries. That the mallard is the duck hunter's basic fare can be quickly checked by a look at the annual bags throughout all the waterfowl flyways. The mallard is by far the gunners staple delight except in the Northeast where the black duck is more sought after simply because there is more of him there. Yes, he's a wondrous feathered part of our land and it would be strange indeed if we

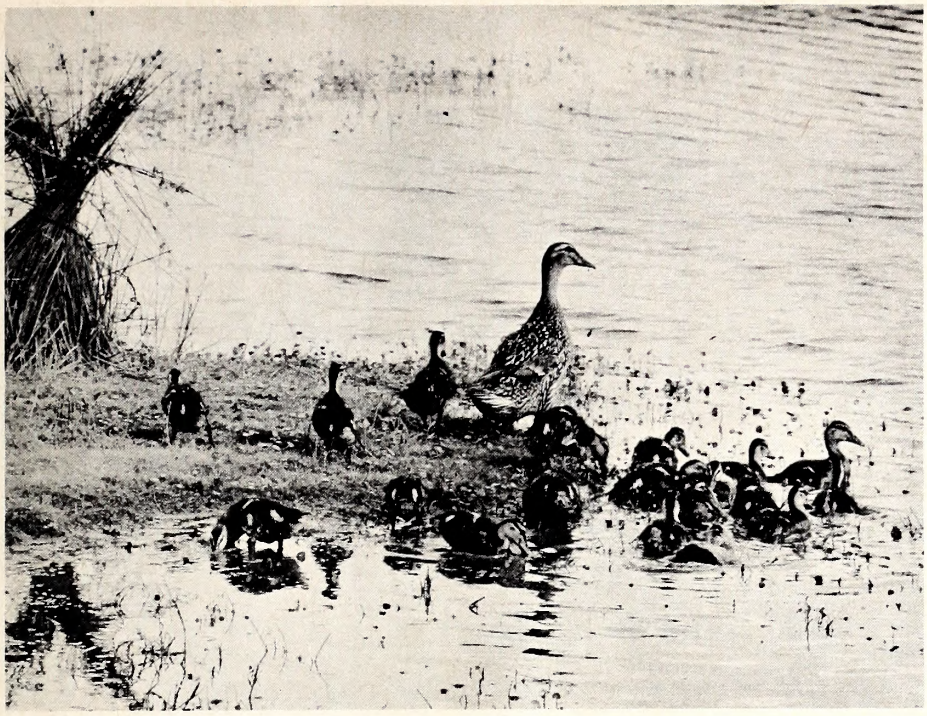


PHOTO BY JOEL ARRINGTON

Mother mallard forages with her growing ducklings at the edge of a shallow pond. Bits of vegetation and insects are found.

didn't have in our midst this duck that belongs to all America.

The mallard likes the less harsh winters he encounters to the south, but plans to work no harder than necessary to get to it, going no further than he has to in search of the comfort and sustenance he seeks. No equatorial ramblings for this fellow as is the habit of his feathered cousins, the blue-winged teal and the pintail, who often end in Panama. He goes until it looks good and not one inch further and there he spends the winter, ranging not far in this chosen place.

Living with man and the calamities of his daily life doesn't bother him much, and it would be better if he was as wary as his close kin—the black duck. But he's not and the wrath of gunfire is hard on his numbers especially in the early gunning days until he learns his lessons the hard way. It's a blessing and a curse too, that he chooses to live so close to man. We see much of him, but he is bound to get hunted hard when he is so convenient.

Many times I have run mallards out of creeks so close by heavily travelled highways that should I shoot the wrong way a driver would surely catch some lead. And of course, Old Greenhead will slip in and out of the multitudes of city parks that usually have their own few mallards, to see what he can pick up while the food is being passed out. The wild ones are not easy to tell from their city brothers. Maybe a sharper coloring, a bit warier, and certainly a little trimmer.

Many a wily old mallard loses his head over the femininity of a city hen and coaxes her into a spring flight to the northern prairie potholes, or as is often the case, she persuades him to give up his travelling ways. The nesting is a springtime affair, but courting comes first, and it's nonsense as far as the mallard is concerned, to wait until spring to turn his thoughts to love. Almost as soon as he dons his winter coat he begins to sort out the hens with a critical eye, and often several males have much the same thoughts about the same hens.

If you are lucky enough to see the courting flight of the mallard, you are in for some airmanship—par excellent, as the drakes and the hen climb and soar in aerial affection until at last she decides which one she wants. But there are other parts of the courting ritual if you watch closely. Watching a mallard hen one day as she sat on the water, bobbing her head from side to side, bill pulled in close to her breast, with a constant guttural chatter. My youngster asked why she was doing that. It delighted her when I told her she was telling her greenheaded boy friend beside her, "I love you".

But if the mallard is a good lover, he's a sorry family man and father. The habit of mating for life of his larger kin, the geese, is astonishing to him. He sheds his hens like he sheds his feathers—each summer. But he will stick to the family hearth until the nesting is assured. The hen prefers ground level to burrow out a little hollow to fill with dry grasses and down pulled from her breast, and into the nest go up to fourteen or fifteen eggs sometimes.

Nests have been found twenty five feet up in the forks of trees where natural accumulations of forest debris has fashioned suitable nests. This acting like the wood duck is not common to the mallard for you mostly run onto nests a bit lower, in the grasses along waterways, or on up a bit on a little higher ground, maybe on an old muskrat house she finds suitable.

The little ones take to water almost at once after their usual twenty-eight day stay in the shell, the mother fussing a lot over them, but the father usually gone. Predators and other hazards are the strict business of the hen now and though she valiantly protects the small ones, it is a lonely fight with no help, and often she loses. The drake off with the rest of the male gang, will soon be in molt, and looking as if he had lost his last friend in his flightless, bedraggled plumage.

The youngsters are ravenous almost as soon as they are hatched and stay that way the rest of their lives. They catch a lot of insects at first, later tipping up in the shallow lake water and streams, long necks reaching,

tails bobbing, they pull out favorite morsels of fish eggs, and small frogs, and sometimes reach some wild seed. Corn is a favorite food of the mallard in his adult days, as is acorns, but he will eat anything that is edible to keep from going hungry which is why a hunter will find a highly smelling one on occasion. The little ones stretch out fast in the summer almost as if they were being blown up and are ready for the southbound trip with flight training all finished.

The mallard can reap a lot of grain which causes consternation in some sections but his help to man is immense. His worth as a game bird immeasurable of course, the hours of pleasure he furnishes not countable; but if he had to furnish the country food in an emergency he wouldn't last three days. Aside from his aching for a good meal of grain, at insect control he is tops. He eats them all without favor if he can catch them, and finishes off with some mosquito larvae, a particular delight, for dessert.

Life is sometimes rough for the mallard, the constant search for food to fill his numbers, and water to suit his habits, the days of the hunter's moon is troublesome, but the gunners do more to assure his continued survival and for his welfare than most anybody else. The survival of the vast breeding grounds, the wintering grounds, and places to rest in between, are his handiwork, and while loving him, the gunner seeks him out as part of the joy of being outdoors.

But despite the harshness of just living, the mallard must have a respite from it, and it seems to me, enjoys his play immensely. I'll not soon forget just a couple falls ago, walking a rocky stream trying to scare out a puddle duck of some sort. Jump shooting the hunter calls it, but the walking and what he sees of most importance, and to a genuine hunter getting a duck secondary.

The October air was dry and brittle and warm, but winter had already touched some of the trees with her colors. I heard the generous gabble of ducks long before I reached the bend in the stream, relaxed and joyous, and my first thought of course was the possible chance for a shot or two. With care I worked to the bend undetected, and to a little hump of an island in mid stream. I'll wager I have never seen so many mallards over my gun barrel, a sight I'll admit to tickle a hunting man, or anybody else.

Greenheads walking about by the dozen, hens curled down comfortably by the stream bank and some picking aimd the grasses. Those not picnicking were swimming. The water came down fast where it narrowed on a bumpy concourse that dropped two feet down in ten feet of travel, into a quiet pool at the bottom. Down the chute some rode, and surely they must have been youngsters, for adults couldn't be having this sort of fun, climbing out at the bottom they waddled leisurely back for another ride.

I watched for a long time, fascinated by now, thirty minutes it must have been as I recall now, and then I stepped out. They were in the air suddenly, all at once as if exploded up, a hundred some strong if there was one. I stood with mouth agape I know. I didn't shoot. I didn't even raise my gun. They rose up and were above the trees now and turning to the right. Soon they were gone down the valley. What they had given me there in the brief half hour of that golden Fall day was more than enough. ⬍

A pair of mallards sweeps low over open water, perhaps looking for some friends.

PHOTO BY LUTHER PARTIN

It's YOUR Wildlife

by Marvin Plummer
Wildlife Protector

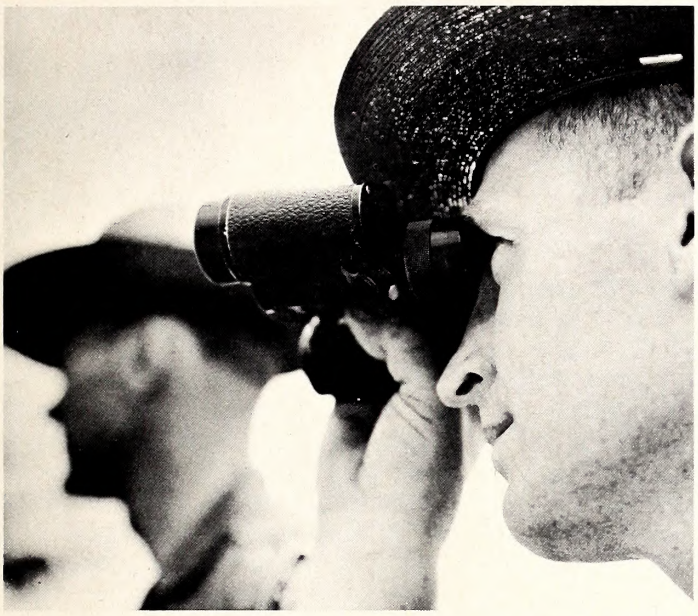


PHOTO BY JOEL ARRINGTON

To report a violation of the game laws, call North Carolina Wildlife Resources Commission at one of the following locations:

Location	Area Code	Telephone
Edenton	919	482-3687
Chocowinity	919	946-4744
Burgaw	919	259-4423
Rocky Mount	919	442-0254
Fuquay-Varina	919	552-5028
Elizabethtown	919	862-3826
Haw River	919	578-1646
China Grove-Landis	704	857-9188
Pinebluff	919	281-3568
N. Wilkesboro	919	838-4618
Valdese	704	437-3215
Marion	704	697-7311
Waynesville	704	456-9292
Raleigh	919	829-7191

You can help protect your wildlife by reporting fish and game law violations to State authorities. Think about it. Can we count on you?

YOU are on your stand and the dogs have been tracking for about an hour. All of a sudden Old Zeb barks out; he's hot on the trail. Now Jack joins the race and soon you hear Bill, Lady, and the rest picking up the trail. They are getting closer; it sounds like the deer is coming by your stand.

Then, three shots. The dogs are still running. You think that they missed, but the dogs stop. You decide to see what the hunter shot. When you arrive, what do you find? Another hunter is just beginning to bleed a doe deer. The hackles bristle on the back of your neck and you think to yourself, "that fellow should be locked up for a good long time. Now where is that . . . Wildlife Protector? He's never around when he should be!"

How many times have you seen this picture or one similar to it? You might not be a deer hunter, but the same situation could confront a bird, rabbit or squirrel hunter. Of course it might not be an illegal sex, but could be an unlawful hunting method or over the bag limit. No matter which, all these are probably the work of game hogs.

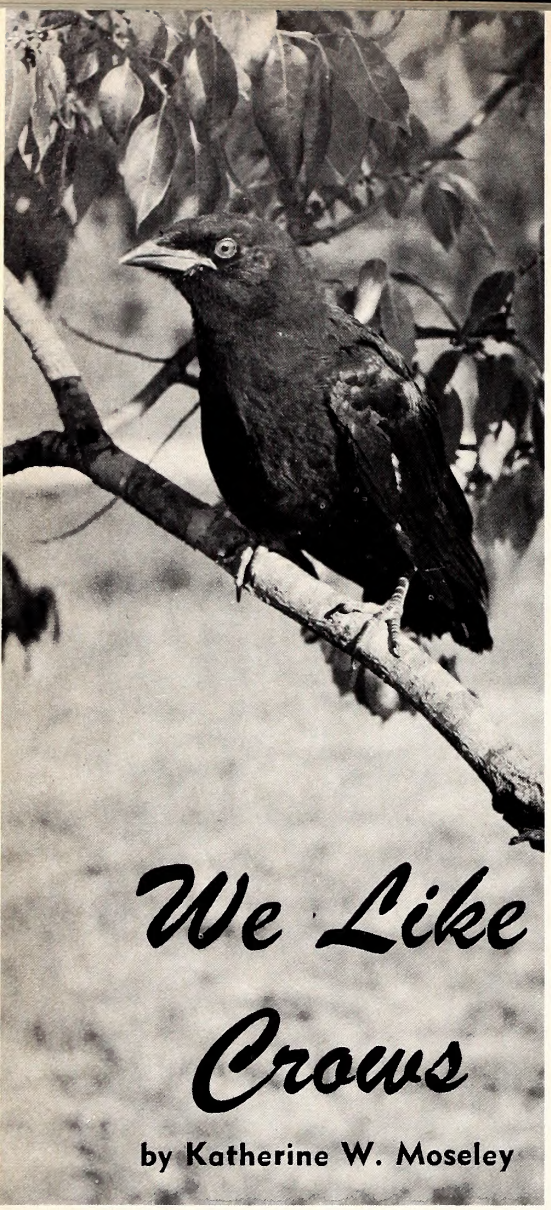
Where *is* the local protector?

How large is the county in which you hunt? I'm sure it has many thousands of acres. One wildlife protector often must cover all of this vast area by himself. He might be working the next hunt or right behind the tree back of you; and then again he could be clear across the county. How can this game hog be brought to justice?

You as a sportsman have a responsibility and a duty in helping protect your wildlife. All over the state the Wildlife Resources Commission has radio stations for reporting fish and game law violations. All you need do is pick up the phone, dial operator and tell her you want the North Carolina Wildlife Resources Commission telephone in your district, collect, and that you want to report a violation. A radio operator will answer the phone and then radio the local protector or the one closest to the violation. If you as a sportsman will co-operate with your local protector by reporting violations, either to the protector or base stations, we can stop these game hogs from taking *your* share of the game.

Maybe you think you would never tell or "rat" on anyone; that it is just tough luck for the protector if he can't catch Mr. Violator. The trouble is, these violators don't hurt the protectors or the Wildlife Commission; it's *your* game they're taking. Yes, it's birds you won't have a chance to hunt, or a doe that won't raise a buck, or a trout that won't be waiting for you next spring.

To protect our wildlife we need the support and cooperation of every sportsman and citizen. If wildlife protectors are to do a thorough job of protecting our wildlife, it is *you* who must help. If you know of a violator, tell the local protector. Then *next* hunting season, we can live up to our Motto "More Sport for More People and an Equal Opportunity for all," with pride and as sportsmen sharing in the work.



We Like Crows

by Katherine W. Moseley

If you think that the crow is all bad, it may pay you to read this slant on the big, black bird. Agree with it or not, you'll learn a bit.

"CAW, Caw, Caw," call the crows winging across the skies from Hudson Bay to the Gulf of Mexico and westward to the arid regions. So—the farmer snatches up his shotgun, the hunter reaches for his rifle, the birdwatcher waves binoculars and every one shouts, "Get away from here, you no-good scoundrels!" That is, everyone except the Moseleys. We like crows.

Arrogant. Raucous, Courageous. Intelligent. Resourceful. Opportunistic. We find them an ever-lasting source of pleasure with their strong deep - black, metallic-violet flashing color, their vivacity and their self-sufficiency.

It all began with table scraps. Bird-feeding is as much a part of our lives as are our meals. We keep three bird-feeders full the year round so naturally we have constant bird-boarders of all sizes and colors. In the winter snow lies deeply and long on our acres in the foot-hills of the mountains, so in addition to the seed we began to scatter whatever was left over from our meals for whatever birds that cared for home-cooking. These birds turned out to be the crows. We had noticed they never came near the feeders and since corn was always spilled there we wondered why.

We have since learned that hard, dried corn is never eaten by crows if anything else can be found and if fed to nestlings is disgorged. So after experimental bites and careful tasting the big black birds decided they loved table scraps. The sentinel crow kept watch from the rail fence or on a low limb and when a fresh supply appeared it would bob its great, inky body up and down and fairly shout, "Chows down." Then the others would sail in and eat like gluttons.

Contrary to popular belief the small birds showed no alarm nor fear while they fed at the feeders or rested in the evergreens while their large brothers ploughed about on the snow-covered ground. This went on for the winter. We watched the crows grow bolder as they flew over the house from tree to tree. But the food on the ground brought in dogs, not just strays, but well-fed, licensed, handsome ones. We love dogs but own two elderly Siamese cats and for their sake felt we should discourage dog visitors. So the free for all buffet ended. The crows sat on the fence and cursed. They shouted and demanded. We hardened our hearts for it was now spring and food was available.

Then it was again winter and the crows remembered. However this winter the resourceful creatures had no need of haphazard hand-outs. They discovered the suet rack securely nailed to a post, covered by hardware cloth but completely available to strong beaks that tussled and pulled the hunks of fat. Never have there been such glossy, sleek, irridescent, well-nourished crows. The suet is given to us by a friendly butcher so there is enough for all the woodpeckers and crows. The two species do not eat together but amiably wait until the perch is empty. Never have we seen a crow make any attempt to molest another bird.

A pair of the crows nested in the tallest white pine tree on a rise above the house. Crows, hawks and eagles almost always nest on the top-most branches of a forest. Crows prefer coniferous trees. The nest was near enough for us to hear the babies cry, at first like the mewing of kittens, later like bawling brats. The nest seemed well made but coarse, of sticks, twigs, tree bark. Crow eggs are greenish-buff, spotted and blotched with brown and gray. There were four infant crows, ugly, with half-naked bodies, large heads and ungainly stomachs. The parents seemed tenderly devoted to their young and spent most of the first five weeks of the birdlings' life bringing food to stuff down the red flannel gaping mouths. This winter we may have to find an extra butcher to continue the suet-job with four new mouths to feed.

The crow call is as familiar as a dog's bark yet in the single syllabeled note, usually given in triplets, the bird is able to express outrage, a warning, a call for help. There is another cheerful, contented sound to the caw, caw, caw, as the flock shifts from the limbs of the old oak to the pines very like continued, animated conversation. Surprisingly, the crows are also capable of singing a rather sweet, musical

warble. Late one summer afternoon when all was quiet my husband and I heard a soft little chorus in the trees overhead. When we moved out to try to identify the birds five crows flew from the trees screaming abuse at being interrupted or overheard. There is also said to be a courtship song, a rattling succession of sharp notes which we have so far not been able to identify.

No one doubts that crows are clever. This is clearly demonstrated in the ways they out-wit farmers and hunters and is borne out by hundreds of tamed crows who play games of finding and "stealing" brightly colored articles. Often pet crows are able to articulate the words and imitate the sounds of the human voice. Experiments have proved that tamed crows are adept at learning and adjusting to new and previously inexperienced conditions.

The crow is usually regarded as a thief, a murderer and a plain nuisance. It undoubtedly does destroy corn, rob nests and eat some harmless creatures. By eating harmful insects the crow makes amends. The examination of a large number of crows' stomachs shows destructive insects make up a great part of their diet. Predacious beetles and grasshoppers are eaten throughout the summer season. Cut worms, grubs, May beetles and June beetles are consumed in quantity and fed to the young in immense amounts. At the time of outbreaks of such insect pests the crow becomes valuable in their control. Crows eat some fruit but usually of the wild kind such as dogwood berries, sour gum, sumac seeds.

Crows are indeed an expensive pest about corn. They pull up newly sprouted seeds which have been softened by germination and later eat corn before it is ripe and in the milk. Crows will not bother corn that is chemically treated when planted. Admittedly it is almost impossible to keep the marauders out of the corn field in the autumn. Outrageous audacity is a pair of rakish crows perched on the shoulders of a scarecrow. Even so it is believed that each crow consumes many bushels of crop-attacking insects in a season, so the big bug-killer may feel that it has earned a share of the crop.

Also the examinations of the crows' stomachs proved that nest robbing is not as universal as supposed. Toad bodies were found and toads are useful but there were more mice remains examined and mice are harmful. We have so many young birds around our country place as well as crows it is hard to believe there have been many bird-murders. The crows help other bird families as they watch for savage hawks and team up to chase one seen out of the neighborhood.

A few hysterical voices have been raised fearful that the crow may join the passenger pigeon, the ivory-billed woodpecker and other lost wilderness residents. Man is the crow's greatest enemy and they have been killed by poison, gunfire, and the bombing of populous roosts. Still they survive in steadily increasing numbers, the most familiar bird to all Americans.

As children we chanted, "One crow for joy, two crows for sorrow, three crows for a letter tomorrow." The Welsh say that the crow symbolizes health, happiness and good harvest, "Two crows you see, Good luck to thee." Englishmen in Essex believe "Two crows are lucky, three is health, four is wealth."

Crows have lived in our land as long as man. Indians knew the bird well and every tribe adopted and used its name as they interpreted it, in some manner. Because of our familiarity with the handsome, noisy crow and its bad habits it may be hard to realize that it is also valuable. Not only for beauty with the graceful, long-winged black body silhouetted against the sky like a note of music but for its contribution to nature's precarious balance. The "Caw, caw, caw" that announces its presence is a nostalgic cry from the past, a contented call of today and we hope a promise of a representative survival-song for the future.

Not many of us think of the crow as a pet. Yet, they will respond to backyard feeding, particularly the young. A powerful natural suspicion is often difficult to overcome.

PHOTO BY TOM JACKSON

Hunting Season Needs

Good Public Relations

by Jerry Shiffert
Reprinted from Winston-Salem Journal

The answer? Sportsmanship; this means consideration of the rights of others, among other things. If we want to hunt on private land, it's high time we improved our outdoor manners.

THE hunter-landowner relationship is important because about 80 percent of the hunting by the American public takes place on private land. It is technically true that the public owns the game, but the private landowner decides who shall hunt it. In most European countries, the landowner owns the game and it is only in the United States that the general public has a chance to hunt.

Hunting on private land is a privilege, not a right, and it must be earned by proof of respect for the landowner's rights if he is to allow public hunting on his property.

The majority of hunters today come from urban areas and are not really acquainted with the farmer's problems. For example, there are few hunters who recognize a field of milo. And very few hunters seem to realize that the crop is harvested late in the fall season and that by walking through the field, several hunters can cause considerable damage.

Winter wheat fields provide little cover for game, but many hunters insist on crossing the field rather than going around the edge. Many times, the hunter fails to notice a farm road into a field and will park his car directly across the opening. Naturally, the farmer becomes furious when he is unable to drive his equipment into his own field.

Fences serve a useful purpose on a farm. Proper fencing is designed to prevent livestock from straying. However, this does not stop some hunters from crossing these barriers despite signs to the contrary. Your North Carolina hunting license reminds you of the state trespass law, "It shall be unlawful . . . to hunt with guns or dogs upon the lands of another without . . . permission . . . from the owner."

It is unfortunate that a small minority of hunters still perform these thoughtless acts as well as those of a more serious nature, such as vandalism, careless handling of firearms, and violations of laws. This is what the general public reads in the news media and unfortunately has given hunting a bad public image.

It is regretable that all the hunters who act as true sportsmen and respect the landowner's rights are also lumped into the same category with this minority. As a result of these events, the private land open to public hunting is dwindling each year. This record *must be reversed* or public hunting as we know it today will be gone within a generation.

I think the hunter, himself, can help to lick this problem by helping to bring these violators to justice. Hunters who violate the law should be reported to the authorities! After all, they are the ones who are responsible for most landowner's closing their land to hunting in the first place. The hunter who is a true sportsman and obeys the law should have no reservations about reporting a violator, since it is he who is largely responsible for our present situation. (See "It's Your Wildlife", page 7).

When you are out in the country, take time to establish contact with landowners. Most farmers love to chat and you will learn about their problems and why they must follow certain farm practices. If you are looking for a place to hunt, go directly to the farm buildings, introduce yourself and ask permission to hunt. Park your car at the barn if this is agreeable with the farmer. This will let the farmer know that you will be responsible for your actions, since you will have to return there when you leave. Remember to thank your host for the good time you had while hunting on his farm. The average farmer is often too busy to hunt and he will be pleased if you offer to share your game with him. After all, his land produced it. Perhaps a gift subscription to this magazine would be welcomed.

Following this ceremony, you will feel like a true sportsman and the farmer will gain some respect for our entire hunting fraternity.

The entire future of hunting, as we know it today, depends upon maintaining a good relationship with the landowner. Will you do your part this hunting season?

NORTH CAROLINA WILDLIFE

RESOURCE-O-GRAM

A ROUNDUP OF THE LATEST WILDLIFE NEWS

November is Big Hunting Month

At some time or other during the month of November the season is open on all of North Carolina's long list of game species except doves. The second segment of a split dove season begins December 10 and runs through January 12. The season on marsh hens (rails and gallinules) ends November 9.

North Carolina boasts one of the longest continuous hunting seasons in the country. The marsh hen season opened September 1, and the raccoon and opossum season in much of the state lasts through March 1. This adds up to six full months and one day of hunting.

Goose, Duck Season Opens

The 1966-67 waterfowl season gets under way half-an-hour before sunrise on November 7 when the Canada goose season opens statewide except on Currituck Sound. Here goose hunting will not begin until the duck season opens November 17. Duck hunting ends January 7, goose hunting January 14. Bag limit on geese will be two daily, four in possession; duck, three daily and six in possession. There are numerous exemptions to these general rules (See October Wildlife and federal regulations available at the post office where you buy the required waterfowl hunting stamp).

Rabbit, Quail, Wild Turkey Seasons Begin in November

November 19 (Saturday) marks the opening of the season on rabbits, quail and wild turkeys in North Carolina. In and west of Stokes, Forsyth, Davidson, Lincoln and Gaston counties there will be no open season on wild turkeys, and the same is true of Anson, Beaufort, Carteret and Pitt counties. Rabbit limits are 5 daily, 10 in possession, and 75 for the season; quail 8 daily, 16 in possession and 100 for the season; wild turkey 1 daily, 2 in possession and 2 for the season.

Time to Order Planting Materials

Persons wishing to receive free planting materials for upland game habitat should apply immediately to: Division of Game, Box 2919, Raleigh 27602.

Don't Forget Christmas Gift Subscriptions!

Attached to this issue are subscription blank forms you may use for giving subscriptions to Wildlife in North Carolina as a Christmas gift your friends will receive 12 times a year. A 20% discount will be given on Christmas orders of 25 or more subscriptions.

Season Permits for Public Hunting Areas

Where Are They Required and Why?

by Frank B. Barick,
Chief, Division of Game

● Most hunters appear to have a pretty good understanding of the Wildlife Resources Commission's new season hunting permit program, but we have received a few calls and letters indicating that a little more publicity would be helpful.

While the new program has its roots in various parts of the Commission's long-standing public hunting area program, it represents a departure from past policy and points the way toward expansion of hunting opportunity in a shrinking world.

On the 22nd day of September, 1966 North Carolina demographers calculated that the population of the Tarheel state passed the five million mark. Population increase, the shift of our State's economy from a largely agrarian base to one involving more and more industrialization, the movement of farm populations to urban industrial centers, the influx of technical personnel from other states —all of these factors and others have had the effect of separating larger and larger segments of our population from the land.

As recently as twenty years ago nearly everyone who hunted had one or even several places to go. This is no longer true. Some 400,000 Tarheels will buy hunting licenses this year—about one out of every twelve people in our State. But more than half of them live in cities and each year fewer and fewer of them have family or friendship ties to privately-owned hunting lands.

Providing this expanding army of landless hunters with places to exercise their sport is the purpose of the Commission's new season permit for public hunting areas program. Since it requires all of the current revenue to sustain the existing wildlife program any expansion will require additional revenue. And since the wildlife program has long enjoyed the distinction of being operated on a sound, self-sustaining, pay-as-you-go basis, the establishment of new fees for the expansion of public hunting areas follows this tradition.

Tarheel sportsmen take justifiable pride in the fact that their recreation is not supported by general tax revenue—they pay for it themselves with their license dollars.

It is inevitable that the first year of any program will experience some growing pains. But we feel that we are off to a good start and that further gains will be made each year. We have accomplished a modest expansion of public hunting areas in this, our first year. The following seven new small and migratory game public hunting areas have been established by lease and/or cooperative agreement:

Hall Farm—1340 acres in Rowan County west of Salisbury

Mitchell Farms—1552 acres in Harnett north of Fayetteville

Holloman Farm—1089 acres in Edgecombe County northeast of Rocky Mount

Keith and King Farms—2409 acres in Robeson County north of Lumberton

Braswell Farm—2000 acres in Union County southeast of Monroe

Corinth Community Farms—2000 acres in Granville County south of Oxford

White Oak River Waterfowl Impoundment — 100 acres in Onslow County, north of Swansboro

These areas are open to hunting for all species of game on Mondays, Wednesdays and Saturdays in accordance with locally applicable state-wide hunting regulations. This means that small game such as squirrels, rabbits and quail may be taken during the small game seasons; doves, waterfowl and shorebirds may be taken during the migratory game seasons; and big game may be taken during the big game seasons—all on the three-dollar season permit required on these areas (in addition to hunting license).

In order to extend an element of uniformity, and to provide a stronger financial base for program expansion, the fee requirement was extended to the nineteen designated dove areas and to other existing small game and migratory game management areas where no fee had been previously charged for hunting. These latter areas include:

Caswell Wildlife Management Area in Caswell County near Yanceyville

Northwest River Marsh in Currituck County near Moyock

Gull Rock Wildlife Management Area in Hyde County south of Lake Mattamuskeet

Goose Creek Wildlife Management Area in Beaufort and Pamlico counties east of Bayboro

Pamlico Point Waterfowl Impoundment in Pamlico County near Lowland

Since the primary attraction on these areas is small or migratory game, possession of the three-dollar season permit authorizes the purchaser to hunt on them for small game, migratory game and even for big game. Here again, hunting is restricted to Mondays, Wednesdays and Saturdays in accordance with locally applicable state-wide seasons and bag limits.

In addition to hunting on all these non-checking station areas, the three-dollar public hunting area permit also provides entry to the other larger checking station wildlife management areas for scheduled small game hunts, be they for grouse, squirrel,

NORTH CAROLINA GAME LANDS

Game Lands with Che g St
Hunters must register at chec station secure daily permit before hu

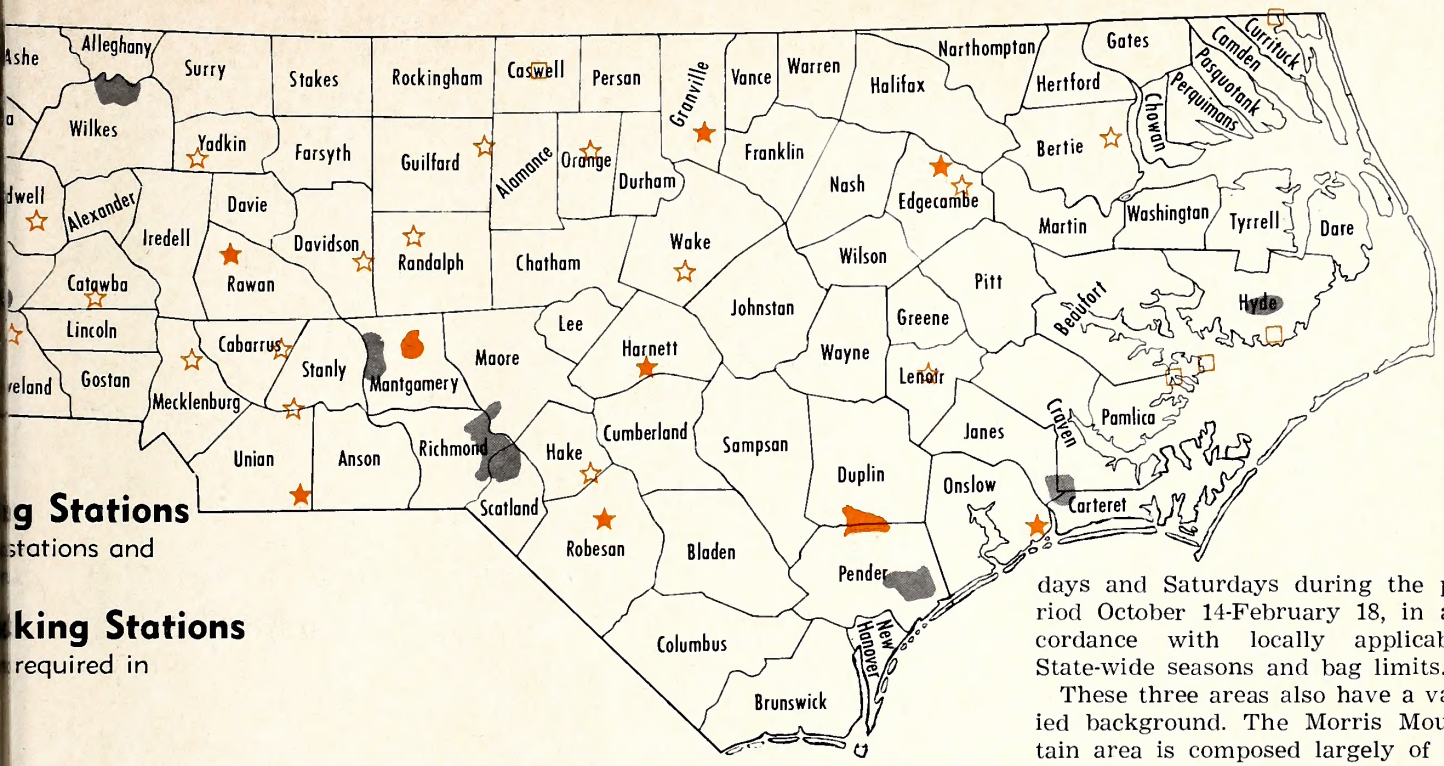
Game Lands without C king
Season public hunting area p requir addition to license

Big game restoration area
$5.00 Season Permit require

State-owned small and migrato e pub
$3.00 Season Permit require

State-owned small and migrato e pub
$3.00 Season Permit require

State-leased public dove shooti
$3.00 Season Permit require



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quail, or dove. *Thus, the three-dollar season permit is a passport to public wildlife management areas in all parts of the State.*

The five-dollar season permit may be used in lieu of the three-dollar permit wherever the latter is required. But the five-dollar permit itself is required only on the following six Commission-designated big game restoration areas:

Blue Valley—6,000 acres in Macon County south of Highlands

Toxaway—15,000 acres in Transylvania County south of Lake Toxaway

Beaverdam—6,000 acres along the north boundary of Pisgah

Green River—10,000 acres in Henderson and Polk counties north of Saluda

Morris Mountain—6,000 acres in Montgomery County east of Uwharrie

Angola Bay—21,000 acres in Duplin and Pender counties east of Wallace

These six areas will receive special treatment in the months ahead to help them serve as focal points for the local increase of deer and other game. At least two of them are scheduled for stocking with deer this winter and all will be identified in the field by boundary line posters, and subjected to special protection by the Commission field force.

Due to the varied status of game populations on the big game restoration areas, different regulations will prevail in regard to huntable species and length of seasons. The Toxaway and Blue Valley areas, for example, will have no open seasons this year on deer or bear. Actually they are to be stocked with deer after January 1, 1967. They will, however, be open for small game hunting on Mondays, Wednesdays and Saturdays from October 14 through December 31. And even though no big game may be taken the five-dollar permit is required.

The Toxaway and Blue Valley are new areas in that they have had no previous status as designated wildlife management areas. The Toxaway area consists of about 13,000 acres of land provided by Duke Power Company under terms of a free lease to the Commission. It also contains about two thousand acres of U. S. Forest Service lands. This Forest Service-owned portion of Toxaway and all of Blue Valley have been designated for special wildlife use in accordance with terms of the cooperative agreement between the U. S. Forest Service and the North Carolina Wildlife Resources Commission.

Three other big game restoration areas (Beaverdam, Green River and Morris Mountain), which have some deer and are located in the part of the State with the November 21 opening date, will be open for deer hunting on consecutive days during the period November 21 through December 3. Hunting for other species is restricted to Mondays, Wednesdays and Saturdays during the period October 14-February 18, in accordance with locally applicable State-wide seasons and bag limits.

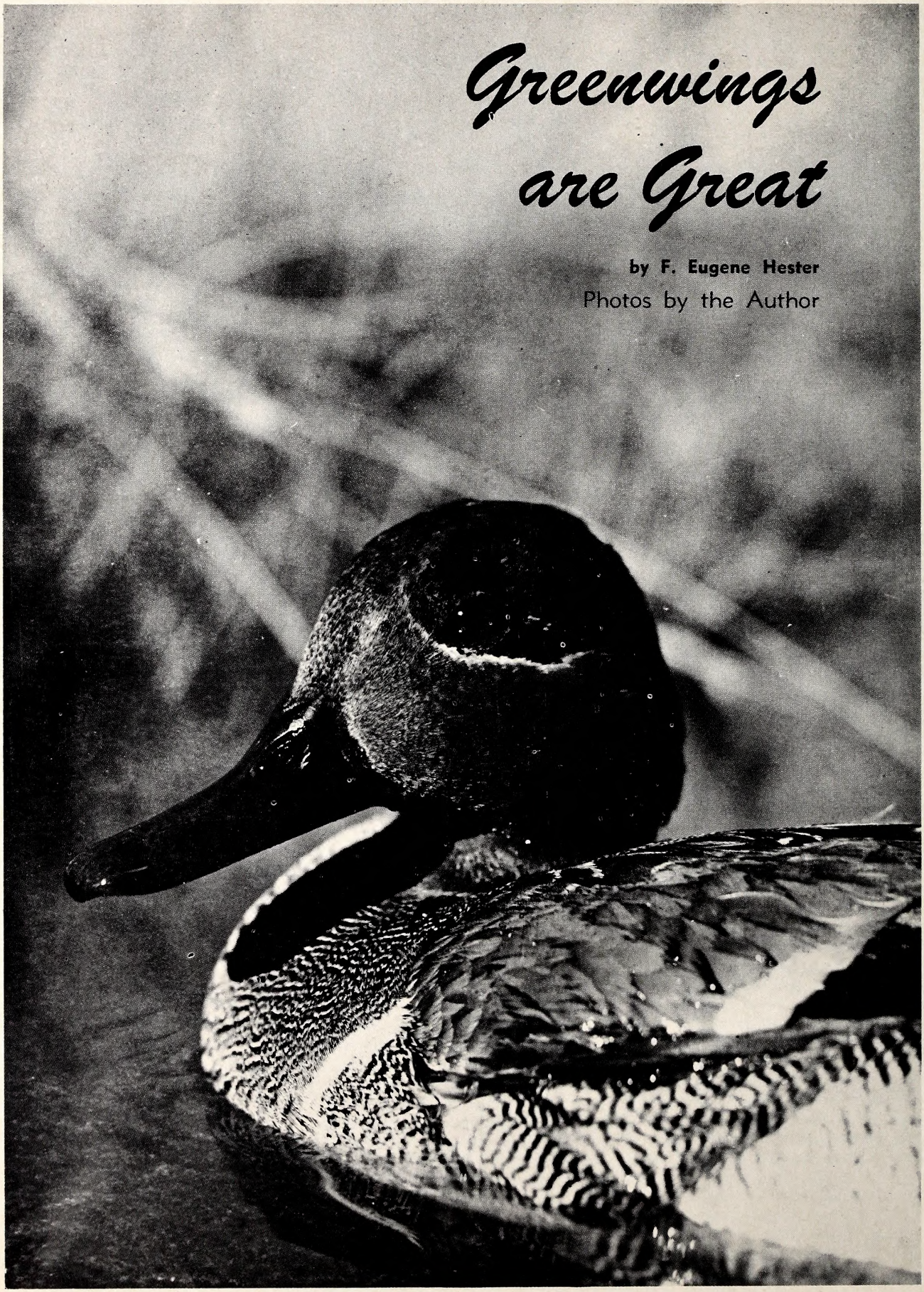
These three areas also have a varied background. The Morris Mountain area is composed largely of U. S. Forest Service land but as of this writing is scheduled to also contain several tracts of privately-owned land to be secured by lease so as to round out the available open territory and to improve access from the county roads that surround it. The Green River area is a Commission-sponsored land acquisition project that was temporarily suspended a few years ago. It consists of about 5,000 acres of purchased land and an equal acreage of leased land. The Beaverdam area is the section designated as the North Pisgah Buffer Zone for the past few years.

All three of these areas have well-established deer herds and we suspect that most of the five-dollar season permits which are purchased, will be used to hunt these areas.

The Angola Bay area was placed in this category because its game land status more nearly parallels the big game restoration areas than the more intensively managed wildlife management areas such as Holly Shelter and Uwharrie. It is anticipated that requiring the season permit for hunting, and intensifying protection efforts, will help prod Angola toward more effective production of big game. It is open for hunting in accordance with locally applicable State-wide hunting regulations with two restrictions: 1) hunting only on Mondays, Wednesdays and Saturdays, 2) five-dollar season permit required.

In summary, the reader should note that season permits apply primarily to the new, non-checking sta-

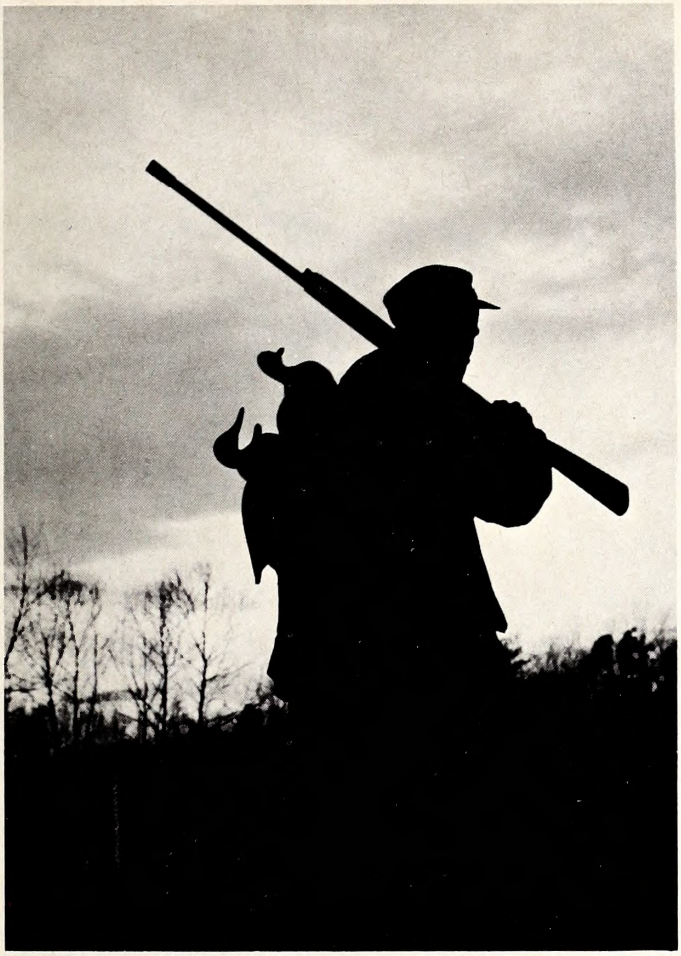
• **continued on page 23**

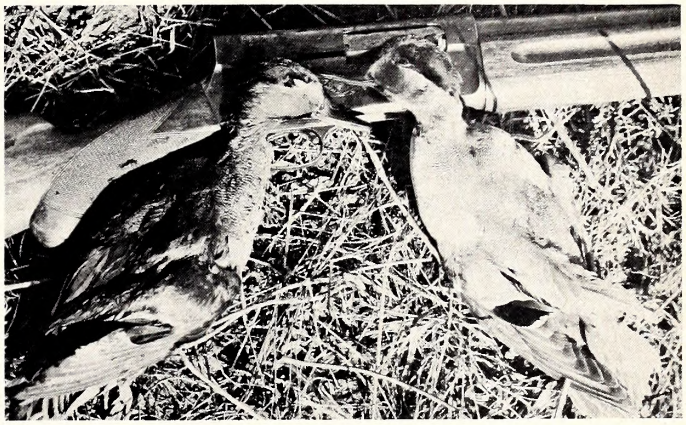


Greenwings are Great

by F. Eugene Hester

Photos by the Author





The time to get there (left) is before you can see what you're doing. Perhaps a half-dozen decoys will do the trick, but the more the merrier. Mallard blocks usually work on greenwings. This colorful little duck is a prize for any hunter.

THE green-winged teal is the smallest of our waterfowl. He is a gorgeously colored and exciting little duck.

The male greenwing is a beauty to behold. His chestnut head with an inch-wide green face patch, together with his gray-colored body, makes this bird one of our most beautiful. The female is a diminutive, mottled-brown duck, less colorful than the male.

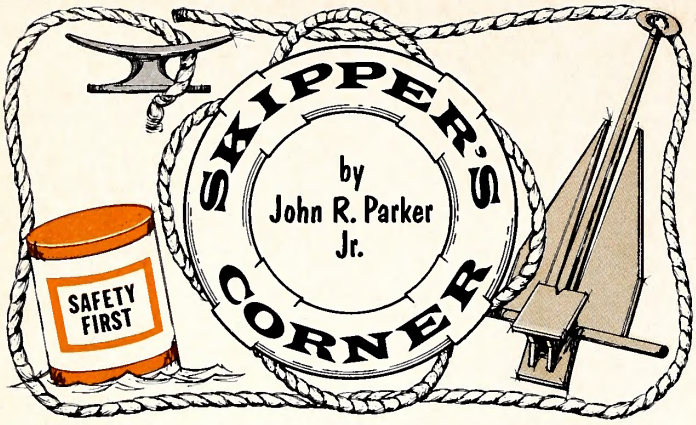
The greenwing, like most other ducks, has a winter home and a summer home. His winter home is a somewhat irregular area covering roughly the southern half of the United States, including North Carolina. It is here that the greenwing spends his winter season, while the northern areas are frozen. When spring approaches, however, the greenwing has a strong urge to move northward to his breeding grounds which may be the northwestern United States, western Canada or Alaska. It is here that the greenwing builds its nest and raises its family. By autumn both parents and young are strong fliers and are winging their way southward for the winter. This cyclic migratory pattern has continued uninterrupted for countless thousands of years and is an example of the great mystery of migration.

The greenwing feeds almost exclusively on vegetable matter. About ninety percent of his diet is normally plant material, especially the seeds and other parts of wild sedges, weeds and grasses. The greenwing belongs to the group of ducks known as dabblers. These ducks normally do not dive for food, but merely tip up or almost stand on their heads in the water while seeking submerged seeds or other food items. Because of his dabbling habit, the greenwing can effectively feed only in shallow water. It is not surprising, then, that the greenwing is usually found in marshes and shallow ponds.

The flight of the greenwing is rapid and erratic. Greenwings often fly in large, compact flocks, and it is here that their quick turns are most dramatic. One cannot help but be amazed at the way an entire flock can so closely coordinate its flight. The extremely small size of these ducks—about twelve ounces—is very deceiving. They frequently appear to be about twice as far away as they actually are and often seem to be flying at fantastic speeds.

Greenwings generally decoy readily. This does not mean, however, that they are not an adequate challenge to the hunter. Their very fast, erratic flight makes them a fitting match for even the experienced waterfowl hunter.

A greenwing is a prized duck. In addition to his fine sporting qualities, the greenwing is a delicious table bird. He is fat, tender, and juicy and is a real table delight when properly prepared.



Last month we advocated fall and winter boating. However, not all of you will choose to do so. The next thing then is proper boat storage. While most boatmen take great care in storing their outboard motor, their boat is often shoved into the backyard and forgotten until next Spring.

If this is your idea of winter storage, you're risking serious damage to your boat, warns the Evinrude News Service. Unless the hull is given proper support it can develop a "hook," a concave distortion usually near the stern of the boat. If this happens, you have two alternatives: sell the boat or learn to live with it. The latter is not always easy. Distortions have been known to cut performance, handling and riding comfort by 50 per cent.

You don't have to go to great expense to store your boat properly. Your trailer will work well if the rollers are adjusted properly. Check this by consulting your owner's manual. Before using any other method, talk to your marine dealer. You might find out it's cheaper and safer to have him store your rig. Hull distortions also occur when gear is stored inside the boat, so avoid this.

Before storing your boat it's smart to perform a little routine maintenance. It should be thoroughly cleaned, inside and out. Ordinary kitchen detergents will take care of most dirt and grime. Marine growths on the hull should be cleaned immediately. If allowed to dry, a job of scrubbing will turn into one of scraping!

All steering cables and pulleys should be checked and, if necessary, cleaned of any corrosion. The same is true for electrical wiring. If permanent fuel tanks are installed, inspect and clean the entire system. Remove the drain plug and bilge pump.

The experts still disagree about the best place to store your boat—inside or outside. A lot depends on the boat. Aluminum and fiberglass hulls are better off in enclosed storage. Wood hulls, which have a tendency to dry out and cause the planks to shrink, are better off outside when normal moisture protects them.

If you select outside storage, make sure the boat is covered with a protective tarpaulin. Provisions should also be made to allow any snow or rain to drain off the covering.

A few words of caution about your trailer are also in order. Now's a good time to re-pack wheel bearings and inspect seals. The winch cable, wiring, brake and directional lights should also be inspected.

The best way to protect trailer tires from deterioration is to block up the trailer. The tires should be touching the ground slightly. For some inexplicable reason, this seems to offer the best protection.

Marine Dealer Is A Storage Specialist

You've got a lot of money invested in your outboard rig. Why risk damage due to inadequate winter storage?

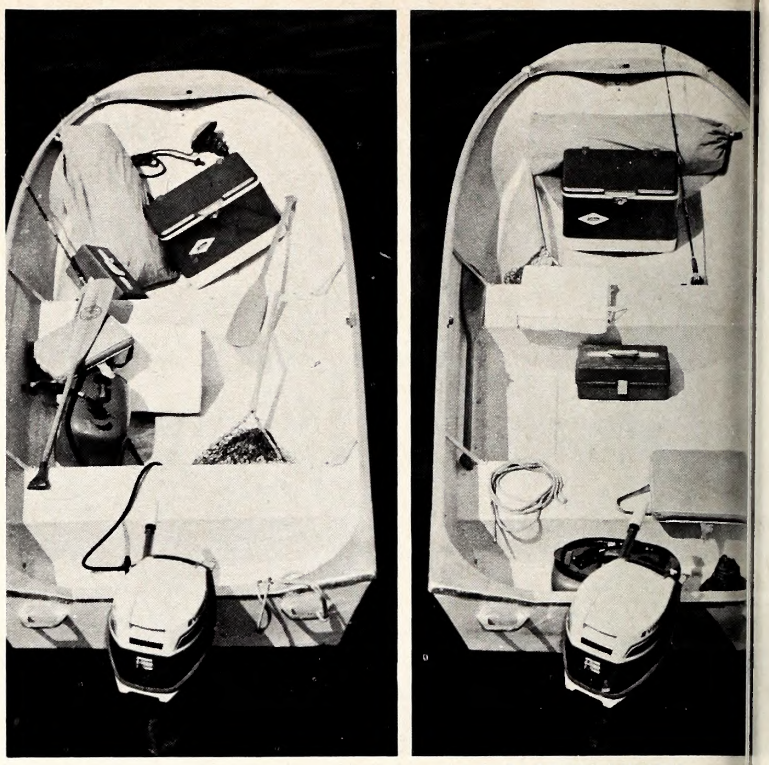


PHOTO BY EVINRUDE MOTORS

Same boat, same gear, but . . . the one on the right has it placed and stored in a proper manner. You are less likely to become entangled in carefully and neatly stowed equipment.

Your marine dealer is a specialist in protecting your boat and motor through the winter months. Many dealers offer tune-up and storage specials. Your outboard is put in top shape for a fast start next Spring, and then stored in a safe, secure area. Temperature and humidity is controlled to prevent moisture build-up and possible damage to your outboard.

New Boating Course

A new home study course in basic boating has come to our attention. The one volume course, complete with training aids, is produced by the Weems System of Navigation and sells for about $20.00. The course is said to use "modern programmed teaching techniques". A final exam is included and a certificate of accomplishment is offered. The Weems course may be of interest to those of you who are unable to attend U. S. Power Squadron, Coast Guard Auxiliary or other courses. The address, Department W—Weems System of Navigation, 84 Maryland Avenue, Annapolis, Maryland, 21401.

Watch Your Step

The many uses to which a boat is put make way for some unusual hazards. Falling overboard, that often discussed accident, is one result of the varied use accident. And in winter it is a real killer. The duck hunter putting out decoys from a boat, the comercial fisherman tending nets or tackle, the sportfisherman standing to cast, any of these could be hazardous if footing is not good. In most areas of the state ice may add to poor footing for at least a few days a year. Wet decks are common the year round and should be respected. Tripping hazards (see photo) or just plain inattention to where you put your feet, are also contributors to this type of accident. This brings to mind the old saying that was restated in a recent Coast Guard publication—"One hand is for the ship and one for yourself." In other words, have a hand hold when moving about a boat, especially under adverse conditions or when doing work from a precarious position.

Signs of the Sportman

by Jes Mansfield
Elizabeth City, N. C.

AS we ride through the Variety Vacation Land of North Carolina, signs of the sportsman can be seen during every season. In autumn and winter the fields are dotted with olive drab figures wearing red caps following the music of a beagle pack seeking to flush the covey that has turned lady into a statue, or stalking the carrier of a dream rack of antlers. In spring and summer the southerly breeze is augmented by the swish of a fly line and the gurgling pop of exploding water as the hook is set and the creel is filled.

The off season lull catches the sportsman rehashing the past season's highlights, surveying the coming season, getting equipment in shape, practicing game management, and always dreaming of the wonderful days ahead. These signs of the sportsman call attention to our vast treasure of natural resources and sports activities that are afforded by our state. Between these glimpses of activity are those signs attributed to the sportsman that are not seen in the woods, field, swamps, or creeks. They are those signs seen on our highways with bullet holes in them.

Our thoroughfares tell a sad story of conservation and citizenship. Each year our highway department spends large sums to provide signs along our roads to give informaton and promote safety. Much of this sum is spent replacing signs that have been shot by gun-slingers that the public mislabels as "sportsmen". Even this high cost is magnified when we consider the bad advertisement produced for tourists traveling through our Variety Vacation State.

Not only is sign shooting costly and unattractive, but it is also very dangerous. Highway signs are located at danger spots on busy or blind sections of thoroughfares, curves, and intersections, thus making very dangerous shooting galleries.

To jump a sign, wait till it stops, and squeeze off a round at thirty paces hardly seems like great sport, yet it is a big practice. The misconception of those who turn to winging signs seems to be this, "With gun in hand and license on hip, every thing is fair game as long as it does not include man slaughter". Nothing marks a novice or dude gunner anymore than the inability to hunt and the impulsive nature to just shoot anything in sight.

Those who cannot down a duck, double on quail, or drop a deer, zero in on highway signs for compensation. The idea is, "If you cannot shoot well, you can shoot."

It is evident by shot placement and grouping that most sign shooters need a lot of practice,—but not on public property. Our game laws are designed to swell the ego of most any hunter and offer him plenty of practic if he can get his limit with his shooting skill. There is practice aplenty in the field or at the shooting range, and the use of a pasture range or a sandpit gallery is far more satisfying than the murder of Highway signs. Skills aquired at such places can be publicized on the sports page, boasted on shoulder patches, and increase your "take home" limit with fewer cripples.

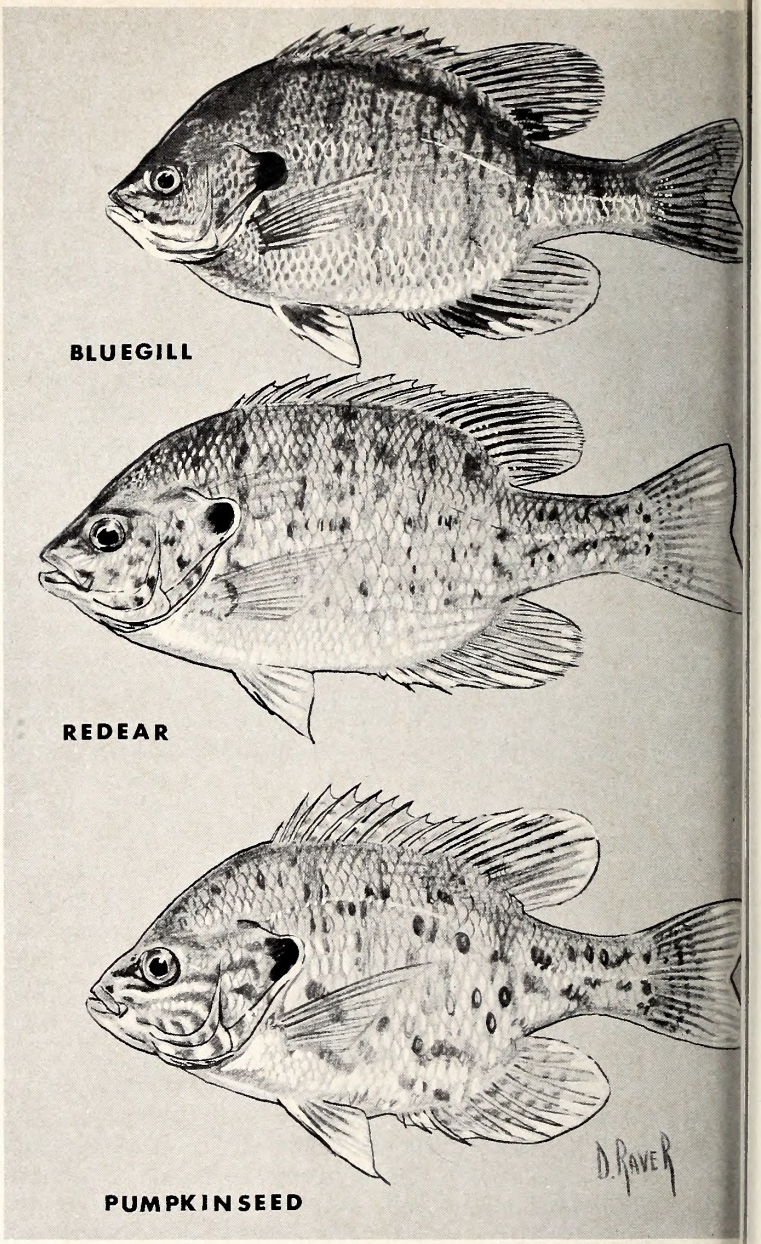
There is no hunting season on signs. Recipes for cooking them are hard to find and they make an awkward trophy with very little conversational value. Still some gunners get their limit each year. The chances of getting caught for this particular misdemeanor of destroying public property is almost nil; however, the cost and the impact on the public will certainly be felt. Legislators are now pressing for more control over firearms use, sales, and ownership. Their political platforms receive very good support from the non-hunting public, and justifiably so according to the evidence available on the shoulders of our roads. Their contentions of wrong use and danger are documented each time you see a lame sign shot in the sides by a pseudo-sportsman.

As the population increases, game gets a bit harder to find, and legislation gets tighter, sign shooting must be stopped, lest we all become branded. The image of the true sportsman can be maintained only by a directed influence towards this end. It becomes all citizens to support the efforts to protect public property, and support all endeavors to conserve our resources through proper education and guidance. Sign shooting can hardly be called a sign of the sportsman, as signs of true sportsmanship are felt and expressed in right attitudes and good practices rather than seen in the costly destruction of highway signs.

The Fish That Chews With Its Throat

by Duane Raver

Reprinted from the Charlotte Observer



WHEN was the last time you saw a two and a half pound bream? A three pounder? How about three pounds and two ounces? Well, they're around in our Tarheel waters—maybe bigger. But the chances are they aren't bluegills, but rather the friendly "foreigner" from the deep south, the shellcracker or redear (that's *red ear*) sunfish.

The term "bream" really is misleading here, although the redear is a close cousin to the bluegill (and the pumpkinseed, and even the crappie, for that matter). He's no "hybrid" nor simply a color phase of the more common bluegill; he's a genuine species in his own right, a valid member of the sunfish family. Externally, the shellcracker is most like the pumpkinseed or common sunfish and next, the bluegill.

One of the most obvious differences between the redear and the pumpkinseed is the *lack* of the wavy blue-green lines on the cheek of the shellcracker, and the slightly larger mouth. Both fish have a pink (or cream-colored, in the case of some redear) border on the ear flap. This sets both of them apart from the bluegill which has a solid black or deep blue ear flap. Generally the common sunfish has only a red spot or half-moon of bright red on the rear of the ear flap, while the shellcracker displays a continuous border of pink, red or buff.

The first hundred or so are the hardest to identify, so don't become dismayed. A fish biologist was asked how he told the difference between the shellcrackers he was rapidly sorting from the pile of otherwise bluegills. "They just look like shellcrackers", was the reply.

Internally, the redear has its "teeth" deep in its throat, pharyngeal teeth they're called. These are two hard, rasp-surfaced grinders that sort of mesh together like your two fists, knuckles touching. And hence one of its names—shellcrackers. In Florida and Alabama, he feeds heavily on snails and other shelled critters, swallowing them whole and grinding them up with the powerful "teeth", and spitting out the shells.

Several years ago, the Wildlife Resources Commission, in its constant search for fish that will liven up our already lively fishing scene, imported a batch of these rugged panfish. Experimentally they seemed to do well, and soon growing populations were taking hold. The U. S. Fish and Wildlife Service almost simultaneously began placing the fine eating sunfish in new ponds along with bass and bluegills. So far, just about everybody is happy.

One rather peculiar thing about the redear is his apparent reluctance to do his best when placed in a pond which already has a thriving population of bluegills and bass. This doesn't happen every time, but more than often, the redear doesn't reproduce well in a pond full of other fish. Actually, in this situation it's rather like gilding the lily to try them anyway when the bass and bluegill fishing is good.

They soon changed their diet in their new homes from shell creatures to small fish and bottom insects. This was undoubtedly from necessity rather than choice since few of our Tarheel ponds and lakes contain thriving populations of clams and

Another load of shellcrackers or redear destined for new, public waters. These are probably not more than a year old.

snails. But this brings up another mark on the minus side of this sunfish: he just isn't a surface lure fish. Don't get the idea that he can't be caught on top; he just prefers something nearer the bottom. The point is, stick to the bluegill with the popping bugs.

Spawning is similar to that of the bluegill, both in general location and time slot. But the shellcracker seems to prefer a bit more brush or vegetation around his spawning site. Water depth varies, but is generally on the shallow side, four feet or less, (Mind you, we said generally!) And the time of spawning is often later than the bluegill although they may overlap. Number of young is about the same; seldom more than the bluegill.

But enough of this background; let's get down to catching this fast-growing scrapper. We said that the redear is first and foremost a bait fish, and so he is. He likes earthworms fished slowly and deep, tiny bits of shrimp bounced off the bottom, crickets, and sometimes grubs. Spring may find them in the shallows and by early summer they begin a slow movement to the deeper sections of the pond or lake; and by fall, back to the flats again. A light spinning outfit brings out the best in the shellcracker, and helps reach the depths you sometimes have to go to get the big ones.

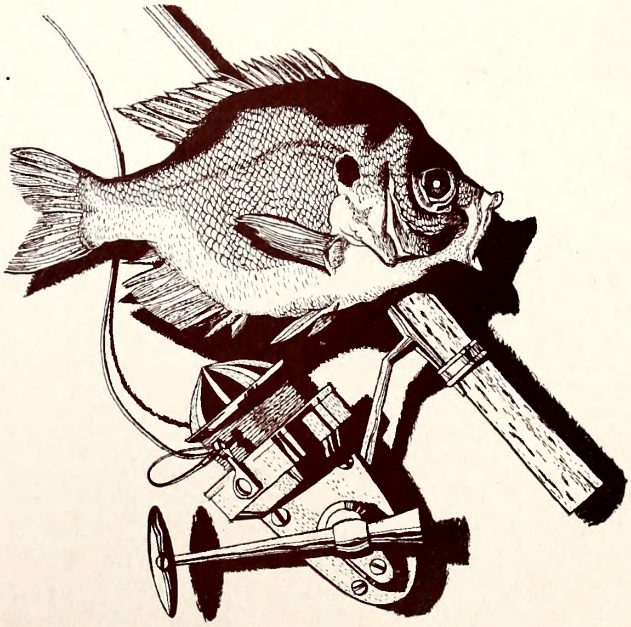
Remember we threw around some pretty big figures like two and a half to over three pounds right at first, and we weren't kidding. This means that fairly substantial tackle is in order, although you aren't likely to snaffle a redear over a pound or so on the average. We'll let you decide about the fighting qualities of this imported sunfish after you've caught several nice ones. You will likely find the scrap a bit different from that of a bluegill right off the bat. At any rate, they "pull pretty good" as the fellow says, so don't think you're overpowered with a six-pound test leader or line. Of course, the lighter the tackle, the more fun you'll have.

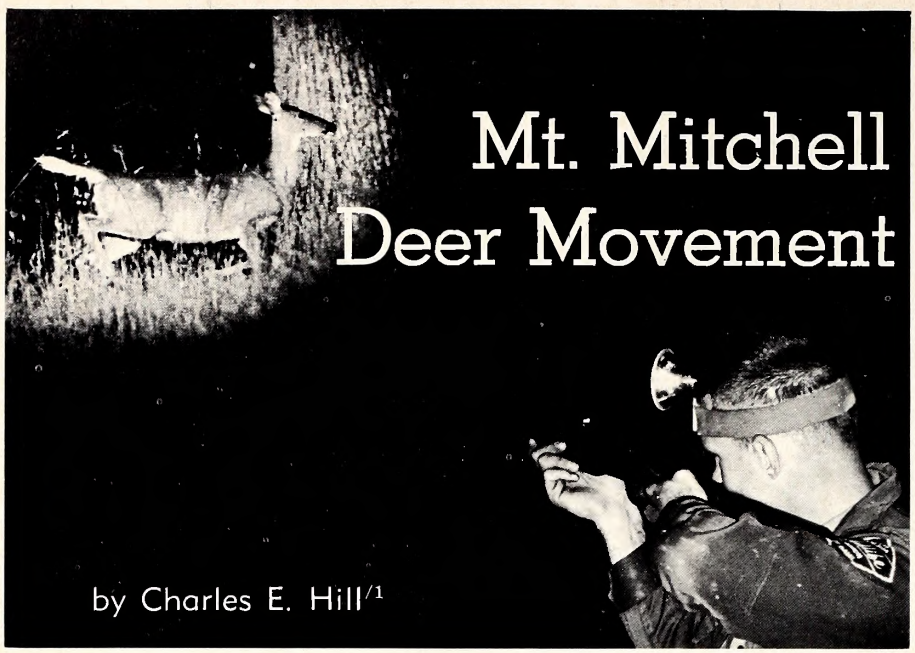
We mentioned some sort of natural bait as the most likely enticer of the shellcracker, and so it is. But during the spring when the fish are spawning, they can be taken on artificial lures regularly. Let's look at the fly rod first. If the beds themselves can be spotted (and this isn't as easy to do as in the case of the bluegill), individual fish can be cast to. Two or three lures should produce if used correctly. First choice is a dirty white or gray streamer tied on a number six hook. Cast beyond the fish and twitch and jerk the streamer past the fish. The strike is one of anger and not hunger, but is usually solid. The fish aren't likely to actually chase the offending lure, so work the area thoroughly.

Another effective lure is a shrimp-shaped fly tied on a short shank number six or eight hook. Work it off the bottom around vegetation for best results (don't be surprised if you hook bluegills and even bass with it too.) Popping bugs? Let me know if you take a shellcracker on one.

As the season progresses and the fish seem to move out a bit (they may still be spawning but in deep water), a small gold spinner with a wisp of white bucktail on the treble hook can work wonders. Just about any reflex type spinner should take redear, if you can locate the fish. Another possibility for the redear is a tiny elongate metal lure that looks for all the world like a miniature necktie clasp. The smallest edition works best and does have tricky action, particularly when fished without a swivel. Since earthworms make good natural bait for the shellcracker, why not an artificial worm? Fine, as long as it is about two and one half or three inches long and of small diameter. Rig them with two number eight or ten hooks and leave off the spinner. Black or gray seems to work best.

On the table, the redear holds his own with bluegills and often inch for inch provides more usable meat than his cousins. So, he has more pluses than minuses, this fish that chews with his throat; he should be on your list right now.





Mt. Mitchell Deer Movement

by Charles E. Hill[1]

DEER hunters on the Mt. Mitchell Wildlife Management Area this year may find their quarry bearing some extra-ordinary ornamentation. Personnel of the North Carolina Wildlife Resources Commission and the United States Bureau of Sport Fisheries and Wildlife last winter spent several months capturing deer within the management area and along the Blue Ridge Parkway[2] to determine how far they travel. Each deer captured was permanently marked with colored aluminum ear tags to aid in tracing their movements. A few animals also were marked with colored plastic ear streamers and collars. The primary purpose of this study is to determine how far deer are moving to use a series of clearcuttings which U. S. Forest Service researchers installed to study better ways of feeding deer and regenerating timber.

Capturing was done by means of box traps and a drug dispensing gun. Food has been plentiful in the area since the clearcuttings were installed, and few deer could be enticed to enter traps. Therefore, most of the deer had to be stalked and shot with a drugged syringe from the special gun. The capture gun has been so successful that use of box traps may be discontinued. The drug used is nicotine, which quickly paralyzes the deer but wears off in a short time.

In practice, the crew, which usually consists of a Bureau biologist, a Blue Ridge Parkway ranger, and a Commission area manager, drives slowly through the area looking for deer. When a deer is found and a hit is made the real fun begins. If the dosage is correct, the deer will usually stagger and fall in about two minutes and a specially trained dog is used to help find the deer. Tags are immediately placed in both ears and the animal is released. The workers are thankful that no transportation of the animal is required since the deer often go sharply down hill into some of the thickest cover imaginable.

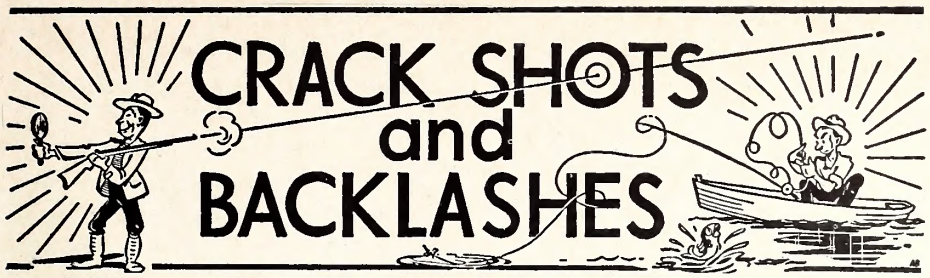
Workers in the area are always on the lookout for tagged deer. Their observations, plus a final observation when the deer is killed and reported by hunters, will help to determine the relative benefit of the clearcutting practice and will indicate how close together cuttings must be in order to maintain good range conditions in all parts of the management area. Most of the researchers are optimistic about the future of clearcutting and predict much higher yields of game and timber as a result. ◆

1/ Refuge Supervisor, North Carolina Wildlife Resources Commission, Morganton, North Carolina.

2/ By special permission of Parkway authorities.

Above, Assistant Manager Joe Scarborough takes aim with a special gun which delivers a deer immobilizing drug. Less than 10 minutes later, the small buck is tagged and ready to go.

This is one of the Curtis Creek clear-cuttings under study to determine their benefit to deer and timber. Recovery of marked deer will show how far they traveled to reach better food.



DEPARTMENT OF LETTERS TO THE EDITORS, FIELD NOTES, AND ITEMS OF INTEREST

Conducted By Rod Amundson

November is the biggest hunting month in North Carolina. The season on every game species is open at some time or other during the month with the exception of doves. Most species were present in excellent supply with the exception of waterfowl. Although there was a good waterfowl crop last spring and summer, the total count is still far below that of the 1950's. The only concession to an increased number of waterfowl is in the increase in shooting hours from sunrise to sunset, to one half-hour before sunrise to sunset, plus a longer season.

With nearly all of North Carolina's game species under fire in November, we can expect it to be the month with the largest number of hunters in the field. This could add up to more hunting accidents, many of which will be predictably fatal.

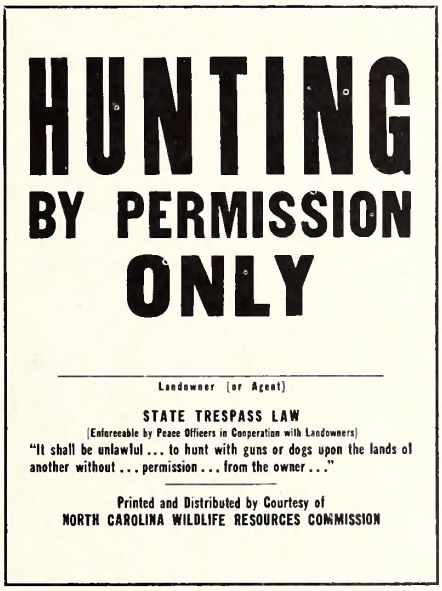
It is almost archaic to say that all hunting accidents could be prevented. Hunting accidents don't just happen—they are caused. People are killed or injured each year because a hunter mistook them for game. This is inexcusable. One of the cardinal rules of hunter safety is "be *sure* of your target." This means, simply, don't shoot until you are sure of what you are shooting at.

Each year people are killed or seriously wounded because they stumble and fall while carrying a loaded gun with the safety catch in the "off" position. The same goes for crossing fences with a loaded gun. If you must cross a fence, hand the opened gun to someone who has already crossed the fence, or unload the gun and put it across the fence ahead of you.

"I didn't know it was loaded" is the worst possible alibi. Why didn't you know is was loaded? Didn't you check it to see? After it went off you *knew* it was loaded.

* * *

Although we haven't said much about it recently, the Wildlife Resources Commission still distributes (free of charge) "Hunting by Permission Only"


HUNTING
BY PERMISSION
ONLY

Landowner (or Agent)

STATE TRESPASS LAW
(Enforceable by Peace Officers in Cooperation with Landowners)
"It shall be unlawful ... to hunt with guns or dogs upon the lands of another without ... permission ... from the owner ..."

Printed and Distributed by Courtesy of
NORTH CAROLINA WILDLIFE RESOURCES COMMISSION

posters to any landowner wishing to have them. These posters have been used by thousands of farmers since 1949, and have played a valuable role in keeping the so-called "hunter-farmer" controversy at a minimum.

Most farmers will allow hunting on their land if hunters would only ask permission first. (See page 10, this issue). The posters mentioned above give a sporting challenge to hunters. Having gained permission to hunt, they are more careful of their conduct.

* * *

Christmas will be here before we know it. You will note the Christmas gift subscription blank contained in this issue. Subscriptions to *Wildlife in North Carolina* make excellent Christmas gifts. If you send in gift subscriptions early enough, your friends will have a good chance of getting the December issue. In addition, of course, we will send them a card saying that you have given them a subscription. With 25 or more subscriptions you can get a 20 per cent discount so that the subscriptions will cost you only 40 cents per year.

* * *

Odds and Ends: More than 1,000,000 women will buy hunting licenses this year.

More hunters die of heart attacks than die from firearms accidents.

If you have given thought to legislation restricting the sale of firearms, remember there are about 20,000 federal, state, county and city firearms laws already on the books in the U.S.

Insurance companies pay more claims for football injuries than for hunting injuries. Hunting ranks 16th on the list of "dangerous" sports.

* * *

When a bear, looking for a handout, stuck his head in the tent of a lady camper in Arizona she gave him one. She conked him over the head with an iron skillet. He ran into the woods shaking his head.

"Will he come back?" she asked a park ranger.

"Not until his ears stop ringing," was the reply.

Towhee?

DEAR SIRS: My husband and I have been readers of WILDLIFE for several years. We look forward to receiving it each month. I especially enjoy any news you issue on the nature of birdlife.

We have living in our yard a small bird we cannot identify. For a while we believed it to be a male catbird, but now we are skeptical. This strange bird is smaller than the dark grey catbird and is so colorful. It has a nearly black cap and back and a reddish breast with some white. This bird looks somewhat like the well-known robin, but is definitely not a robin. It is strictly a "loner," staying in a grove of trees and is always very busy

KNOW YOUR PROTECTOR

Charles J. Smith

Wildlife Protector Charles J. Smith was born June 19, 1938, in Caswell County. He is the son of Mr. and Mrs. Julius L. Smith, Sr. of Locust Hill, North Carolina. Mr. Smith graduated from Bartlett-Yancey High School at Yanceyville, North Carolina, and spent two years in the Army stationed in Kitzengen, Germany. Prior to employment with the Wildlife Resources Commission, Smith was employed by the Greensboro Police Department. He was called back into service for six months during the Berlin Crisis and then employed by the Reidsville Police Department for two years.

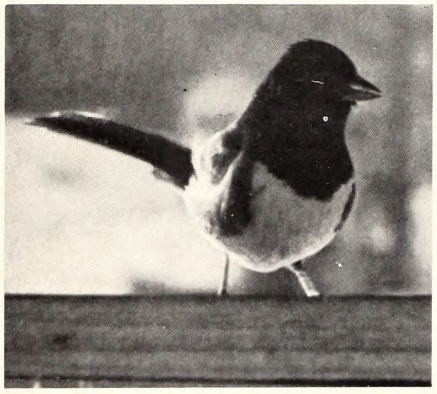
Smith completed the Pre-service Training School for Wildlife Protectors at the Institute of Government in Chapel Hill in 1961. On November 12, 1962, he was assigned to Columbus County as a Protector Trainee. On December 12, 1962, he was transferred to Robbins in Moore County. Since his initial employment, he has completed four In-service Training Schools.

Smith is a member of the Moore County Peace Officers Association, Robbins Rescue Squad, and Vice-President of the Woodmen of the World, Camp 1089 at Robbins. He is married to the former Elaine Tate of Ruffin, North Carolina, and has one son, Charles Kevin, one year old.

DIVISION ENFORCEMENT RECORD FOR AUGUST, 1966

HUNTING & FISHING	
Persons checked	18,756
Total prosecutions	528
Total convictions	512
Total cases not guilty	4
Total cases nol prossed	12
Total fines collected	$2,144.20
Total costs collected	$4,721.30
BOATING	
Persons checked	6,463
Total prosecutions	252
Total convictions	235
Total cases not guilty	9
Total cases nol prossed	8
Total fines collected	$ 859.25
Total costs collected	$2,161.15

All fines and any arrest or witness fees are paid into the school funds of the counties in which the violations occurred, and no part of the fines or costs collected are paid to the North Carolina Wildlife Resources Commission or its personnel.



scratching in the ground and leaves. Very seldom do we see it at the bird feeder during the two years we have watched. I would like to send a picture to you, but this little bird is much too skittish.

Please send us some information. A feature story on the grey catbird would be welcomed also. One of our two catbirds is practically tame, hopping around us within two feet behaving as though she wanted to be petted! (MRS.) CHAWORTH L. AVERITT, ABERDEEN

Sounds to us like a red-eyed towhee, a bird of the woodland edges. Ed.

Summer of '93

DEAR SIR: The startled sailfish on front of July **Wildlife** is a beauty. And the other specimens on the backcover with their beautiful streamlined contour outlook. But I want to talk about "Born To Die" by Grace Draper; in the year of 1893 or 94 in west Arkansas, we had a locust(cicada) year that has never been equalled since. They called them the Phairoah locust. They whistle a loud clear "Phairoah" and were there by the billions. Two men could not make themselves heard a 100-yards apart. A large cow bell could not be heard 100 yards away. A pack of hounds in full chase 200 yards away could not be heard. Two large trees in our backyard, in the afternoon 1000 locusts could be seen flying between them continuously. During low water in the Cassitat River, there were reeds and grasses growing as a shoal 150 feet wide and the cicada were in drifts against the reeds four to six inches deep across the entire shoal—as I recall; cicada and their skins lay four inches deep under the wide extended branches of a giant beech tree—never since a locust year like that one. DAVID J. EDWARDS, CALVIN, OKLAHOMA

$100 Award In Ornithology

In order to stimulate research in the field of ornithology through the use of *bird banding* techniques or available banding data, the EASTERN BIRD BANDING ASSOCIATION makes an award of $100 to a student, undergraduate or graduate, who uses bird banding in an ornithological study.

Applications

In order to apply for the award, the student merely writes requesting consideration, and encloses a description of his project in which he explains how he uses bird banding. His description must be signed by the head of his department.

Qualifications

The college or university must be within the United States.

If the applicant is an *undergraduate,* he must: be either a junior or senior; major in zoology or biology; earn at least a B average; USE BIRD BANDING AS PART OF HIS RESEARCH.

If the applicant is a *graduate student,* he must major in ornithology, and he must USE BIRD BANDING AS PART OF HIS THESIS.

Although the Eastern Bird Banding Association would like to publish in our journal a paper written by the award recipient

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bird is much too skittish.

on his project, this is NOT requisite.

Previous descriptions ranged in length from well under 1000 words including a few supporting tables to several times that length including voluminous supporting data.

Time Limitation

The applicant's research description, properly signed by his department head, must be received prior to February 28, 1967.

ADDRESS APPLICATIONS AND QUESTIONS TO:

Albert Schnitzer
Chairman, Memorial Award Committee,
Eastern Bird Banding Association,
155 Wild Hedge Lane
Mountainside, New Jersey 07092

Whiplash?

DEAR SIRS: I would like to have confirmation to my belief that the snake in the picture enclosed, from *The Monroe Enquirer-Journal,* is not a coachwhip but a black rat snake. The full length of its body being black and the markings underneath its throat lead me to believe this.

Is it not also true that it is an extreme impossibility for a coachwhip to whip anything with its tail?

I have always been a student of nature, and plan to be a zoology major at N. C. State University this next year. Mistaken articles such as this one are very annoying to me because of the resulting effect on unknowing readers of the article. ALVIN BRASWELL MONROE

● The snake in question was probably a pilot black snake, but it is difficult to make accurate identification from a photograph. Coachwhip snakes *DO NOT* whip people despite hearsay to the contrary.—Ed.

PHOTO BY LUTHER PARTIN

Are you ready for winter? Well, ready or not, here it comes. This gray squirrel (with a slight itch at the moment) surveys the situation from a sycamore perch; I'll bet he's ready.

SEASON PERMITS

● continued from page 15

tion areas. The one exception is that they may also be used for small game hunts on the older areas where hunters must register at the checking station before hunting. It should also be observed that initiation of the season permit in no way changes hunting procedures on the older, checking station areas since small game hunting was allowed by season permit on these areas last year. Daily permits are still required for deer hunts, boar hunts, wild turkey hunts, and raccoon hunts.

Full details about regulations governing hunting on these Commission-managed public hunting areas are contained in "Official Regulations Governing Hunting on Game Lands" available on request free of charge from the Commission's office at Box 2919, Raleigh, 27602. These regulations are in the form of a fold-out highway map showing locations of all public hunting areas, with hunting schedules and regulations on the other side. ⬍

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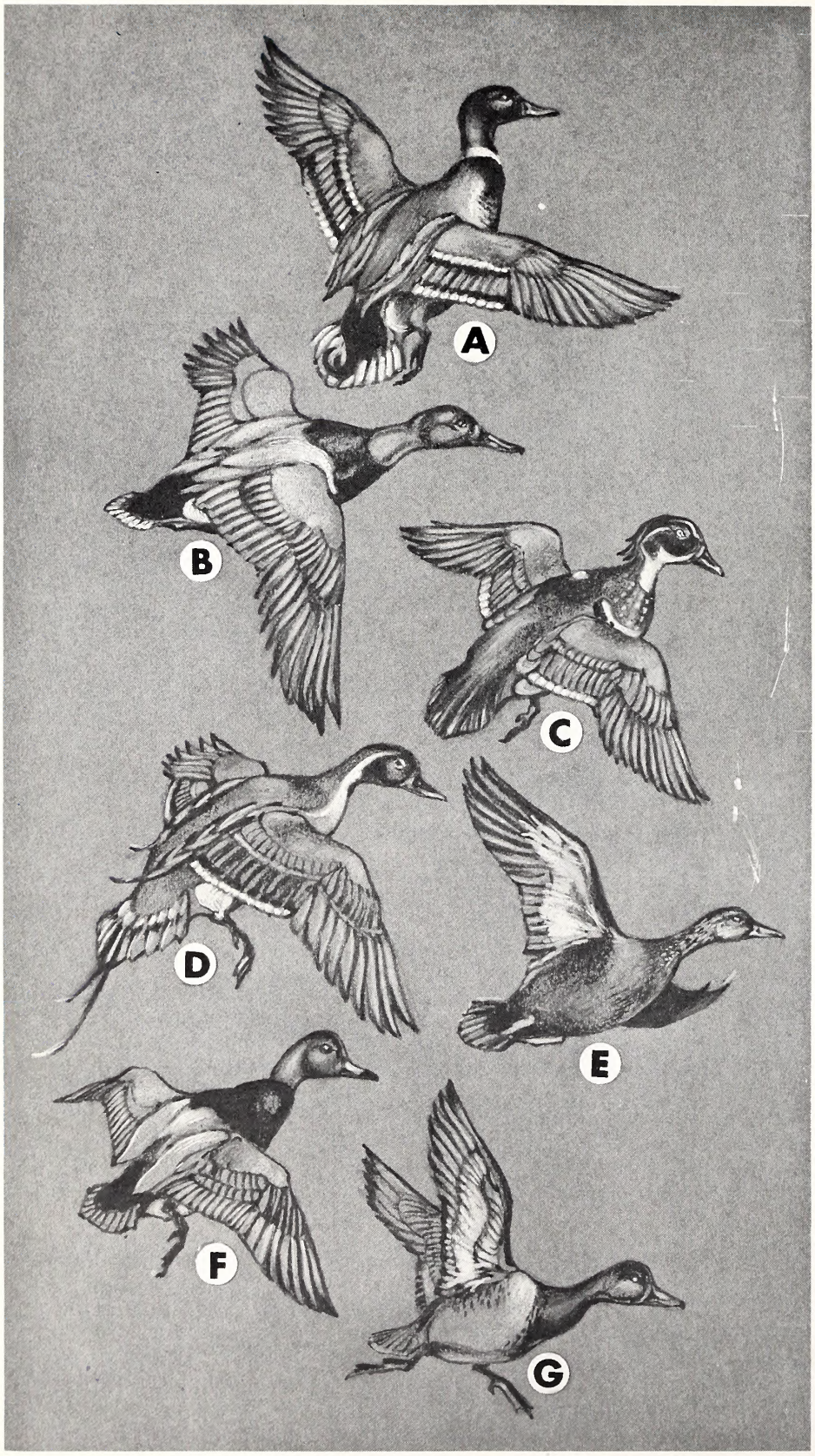

KNOW YOUR DUCKS

A MALLARD The drake is one of our most readily identifiable ducks. Green head, white neck ring.

B CANVASBACK This diver has a reddish head with a sloping forehead and heavy neck. Wing beat is rapid.

C WOOD DUCK A small duck with brilliant markings in the male. Likes wooded ponds, swamps and rivers.

D PINTAIL Long tail feathers and long, graceful neck mark this popular duck. Female is quite drab.

E BLACK DUCK The flash of white on the underside of the wings identify this sooty, dark brown bird.

F REDHEAD The dark red head has an abrupt forehead and the bird is smaller than the canvasback.

G SCAUP This diver comes in two editions, the greater and lesser. Look for a dark head and short bill.

LITHO BY THE GRAPHIC PRESS, INC., RALEIGH, N. C.

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Wildlife IN NORTH CAROLINA

DECEMBER, 1966

PHOTO BY KARL MASLOWSKI

Majestic Visitor

The golden eagle, largest of our birds of prey, attains a maximum weight of eleven pounds. Unlike the bald eagle, the head of the adult is a tawny brown and the legs are feathered to the toes. It is seldom seen in North Carolina. For portraits of other birds of prey, see pages 14 and 15.

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WILDLIFE IN NORTH CAROLINA recognizes the need for close cooperation between State and Federal conservation agencies and the people who hunt and fish—to bring about a restoration of our renewable resources. The Editor gratefully receives for publication news items, articles, and photographs dealing with the North Carolina out-of-doors, but reserves the right to reject materials submitted. Full credit is given for all materials published.

* * *

Second class postage paid at Raleigh, North Carolina 27602.

* * *

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DECEMBER, 1966 VOL. XXX, NO. 12

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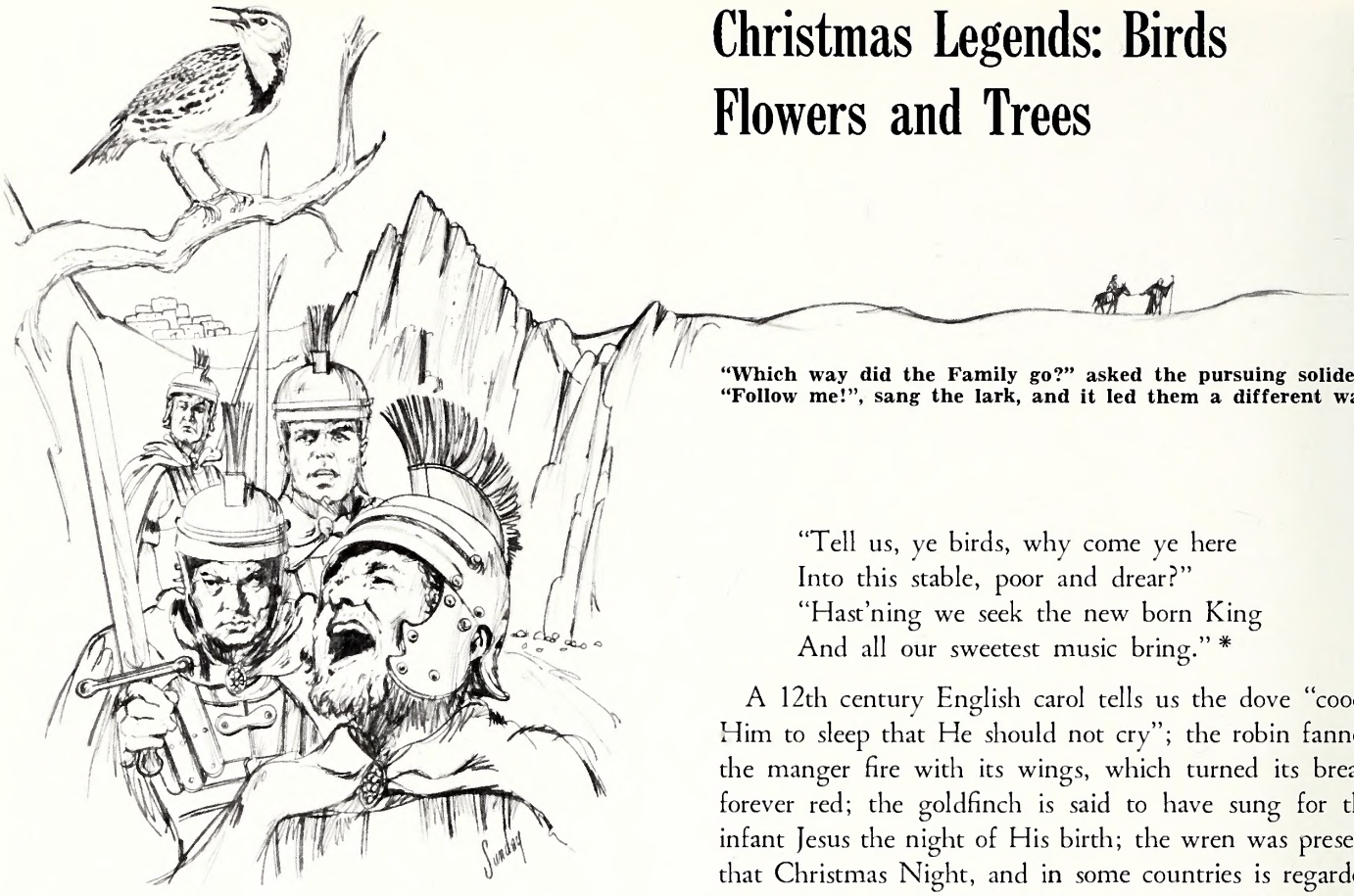
JOHN PARKER - - - - - OUTDOOR SAFETY
TOM JACKSON - - WRITER-PHOTOGRAPHER

There's something about the bursting take off of a bobwhite quail that can unnerve the staunchest of hunters. They often select just the right moment when our attention is diverted ever so slightly, or when a gust of wind blows a speck in our eye, or . . . well, we all have our excuses. A part of quail management is harvest of the crop . . . and the time is now. Painting by Kent Pendleton.

Christmas Legends: Birds Flowers and Trees



"Which way did the Family go?" asked the pursuing soliders. "Follow me!", sang the lark, and it led them a different way.

by Grace M. Draper
Illustrated by Mike Sunday

IN our celebration of Christmas every year, all of us — young and old — look forward with renewed delight and wonder to the retelling of the many lovely traditional legends and stories that have been handed down to us from all ages and cultures. "The Christmas Book of Legends & Stories" by Elva S. Smith and Alice S. Hazeltine (Lothrop, Lee & Shepard Co.) states: "These various legends and traditional tales, which sprang up among the people like flowers by the wayside and became a part of the life of the Middle Ages, have a distinct charm of their own. Their childlike faith and simplicity of thought" endear them to us anew each Christmas—the stories surrounding Mary and Joseph's journey to Bethlehem, the birth of Jesus, and the subsequent flight of the Holy Family to escape Herod's wrath. Some of the most appealing stories have to do with favorite birds, and with flowers, plants and trees.

Christmas carols from many countries are our fortunate heritage, and one lovely French carol asks "Whence Comes This Rush of Wings?"

> Whence comes this rush of wings afar
> Following straight the Noel star?
> Birds from the woods in wondrous flight
> Bethlehem seek this Holy Night.
>
> "Tell us, ye birds, why come ye here
> Into this stable, poor and drear?"
> "Hast'ning we seek the new born King
> And all our sweetest music bring." *

A 12th century English carol tells us the dove "cooed Him to sleep that He should not cry"; the robin fanned the manger fire with its wings, which turned its breast forever red; the goldfinch is said to have sung for the infant Jesus the night of His birth; the wren was present that Christmas Night, and in some countries is regarded as sacred. It was William Blake who said "He who shall hurt the little wren, Shall never be beloved by men".

Legend further tells us that the stork was present that Holy Night. The stork is a good luck symbol in Palestine; and farmers believe it brings spring crops. It has been regarded as a bird of good omen since the early Middle Ages, especially among the Teutonic peoples.

It is said that bluebirds were originally grayish in color, but due to their beautiful singing the night of the Christ Child's birth they were granted a wish, and took on the blue of the sky as their color and became a symbol of happiness.

Each night Mary sang the Babe to sleep. One night when He was restless, a nightingale joined in a lullaby, and it is said a grateful Mary endowed all nightingales with her lovely voice.

Mrs. Helen S. Knaus, writing in the *Miami Herald,* tells of a Spanish legend as follows: "When the Holy Family was seeking escape from Herod and his soldiers, birds accompanied them, encouraging them with song. When it seemed they would be overtaken, a dove and a quail flew to safety, but a lark led them into concealment. When the soldiers asked 'Which way did the Family go?' the lark sang 'Follow me!' and it led them away. Returning to the Family it journeyed on with them. Since then quail have been unable to fly to great heights and

* By permission of H. T. FitzSimons Co., publishers, "Noels", by Marx and Anne Oberndorfer.

Romans (above) used holly to send to friends as a token of good will. The robin fanned the manger fire with its wings; the heat turned its breast red.

they sleep on the ground in a circle, heads pointing outward toward their enemies. The dove has since been unable to sing a glad song but laments its sadness for forsaking the Holy Family. The lark continues to sing its flutelike song and is known as a herald of strength."

PERHAPS a new tradition can be begun with our own modern custom of preparing tidbits with which to decorate an outside "tree for the birds" at Christmastime. This is a delightful way to express our appreciation to the birds for their singing, beauty and helpfulness all year long. In the Northwest, a custom of many Scandinavian-Americans is tying bunches of wheat or barley to a pole to feed the birds at Christmas, just as they do in the Old Country.

As the Christ Child grew and became a playful boy, Jewish legend tells us about a group of children, including Jesus, going down into the valley to make mud-sparrows from meadow clay. As each child finished and arranged his birds in rows, he would command the birds to "Fly!" But all the birds, being earthen, remained intact; except for the bird the little Jesus had made. When He leaned over and whispered, "Fly up to Heaven! Fly!" the little mud-sparrow spread its wings and swiftly soared into the sky!

Surely it is fitting that flowers of every kind, beloved by all and used to celebrate happiness as well as sadness from the very beginning, should have an important place in legends and traditions associated with Christmas. From the time of the Middle Ages people brought fruit and other flower-bearing trees into their homes to induce them to bloom at Christmas. Many of our familiar flowers, leaves and fruits have religious connotation or symbolism, such as: *clover* — the Trinity; *columbine* — gifts of the spirit; *dianthus* (pink)—Divine love; *evergreens*—eternal life; *grape*—Holy Communion, abundance; *iris*—Virgin Mary, majesty, power; *ivy*—everlasting life; *Madonna lily*—immortality, chastity, purity; *olive branch*—peace; *palm leaves* — eternal peace; *pomegranate* — resurrection (Ancient legends tell us it was the "tree of life" in the Garden of Eden, and from this belief it became the symbol of hope of eternal life in early Christian art); *rose*—Madonna, love; *strawberry*—the Virgin; *wheat*—staff of life.

Many of our Christian customs concerned with decorating with evergreens had origin in early Pagan festivals. One of these was laurel, first used by ancient Romans as an emblem of peace, joy and victory. Later Christians used it for decoration in windows of their homes to indicate that Christ had entered there.

Holly was used in the celebration of early Roman holidays, and the Romans used it to send to friends as a token of good will. An early belief was that use of it cast a spell over animals, causing cattle to kneel in their stalls on Christmas Eve. The holly wreath appears to represent the crown of thorns which Christ wore on the cross, with the red berries symbolizing drops of blood. Our round Christmas wreaths are symbolic of eternal life; wreaths of flowers and fruit are symbolic of the cycle of seasons. The Della Robbia wreath, combining fruits and flowers, was originated from art work of an Italian sculptor living in Florence in the 1400's.

Mistletoe brings love and laughter into the home if

suspended in a prominent place. The word "mistletoe" is an old English word which means "different twig." Ancient Britons thought the plant had power to protect them from evil—a sprig was worn as a charm or hung in the doorway for good luck. A tiny bit of mistletoe in the invitation to a Christmas dinner or party is said to have originated in Colonial days. It is meant as a wish for happiness and prosperity throughout the coming year. Scandinavian mythology has given us a lovely legend about mistletoe, which would seem to accord mistletoe the symbolism of victory of love over death. It is said that Hodur killed Baldur, the god of poetry and eloquence, second son of Odin and Friga, with an arrow made of mistletoe. When the arrow was removed, the mistletoe was given to Friga who brought him back to life through her love for him, her tears becoming crystallized as the pearly berries of the mistletoe. It was thus divinely ordained that mortals should henceforth hold mistletoe sacred, and that it should never grow on or under the earth, but be ever suspended between earth and heaven.

Another belief is that kissing under mistletoe was originated by Roman enemies who met under it to make up their quarrels. Anon . . . "Who is she that will not allow, A kiss claimed under the mistletoe bough?"

During Christmas week in Elizabethan England, churches were decorated with rosemary branches. (Sprigs of rosemary, sometimes gilded, and with bay leaves, were carried in wedding processions.) It is said that the rosemary flowers were originally white and odorless, but changed color when Mary, during the flight into Egypt, cast her purple robe over a rosemary bush. Its sweet odor is supposed to have come from the swaddling clothes of the Baby Jesus, which were hung on its branches.

The bay tree, with purple berries and lance-like leaves, is said to have sheltered the Holy Family during a thunderstorm. It is believed that lightning will never strike a bay tree, and its branches carried indoors at Christmas will serve as a protection against misfortune.

A German legend states that because the aspen tree did not bow in reverence to Mary on her journey into Bethlehem (when all other trees, birds and flowers did bow), its leaves must forever shake and quiver.

Legend tells us that the ash tree, though green, burned in the Bethlehem grotto that first Christmas Night, and by the ashwood fire the Child was bathed and dressed. Ever since this wood is supposed to burn more brightly and warmly on the hearth, no matter how freshly cut, than any other.

The "cherry tree legend" tells of how Joseph became convinced that Mary was to be the mother of the Son of God. En route to Bethlehem, they came upon a cherry tree, and Mary asked Joseph to pick some for her. But Joseph, impatient that they be on their way, declined. Then Mary asked God's help, and the tree bent down toward her so that she might pick some cherries. Joseph, now understanding, fell upon his knees before Mary and begged forgiveness.

A legend of the ancient pine tells how the exhausted Holy Family, when fleeing from Herod's soldiers, sought sanctuary in a huge, hollow pine. The tree lowered its fragrant branches, concealing the Family, until the soldiers passed. When morning came, the Child raised His arms in blessing. Some say a pine cone cut lengthwise will show the imprint of His hand.

An ancient English legend tells the story of St. Joseph of Arimathea, in whose tomb Jesus was laid away, who planted his hawthorne staff in the earth near Glastonbury. It took root, grew into a tree, and has blossomed every Christmas since that time, with lovely white blossoms. (Historians feel that Joseph of Arimathea was exiled because of his Christian faith and travelled to that section of the world now known as England.)

The poinsettia, our universal American Christmas plant, came to us from Mexico, where it is called the "Flower of Christmas Eve" (*Flor de Nochebuena*). It was brought to his home in Charleston, S. C., by Dr. Joel Roberts Poinsett, our minister to Mexico, in 1828. A 16th century legend tells of the origin of this flower, symbolic of Christmas. A little Mexican girl, worshipping at the newly built National Cathedral (built on the site of the principal pagan temple of the old tribe of the Aztecs) wept because she had no flowers to place beside the manger. An angel appeared to her and bade her take to the altar the weeds she held in her hand. As the child did so, the weed blossomed into the vivid and beautiful poinsettia!

THE legend of the Christmas rose also concerns the miracle of a common weed being transformed into a love gift for the Christ Child. When Wise Men from the East came, bringing gifts for the Baby Jesus, a little shepherdess, watching from afar, wept as she had no gift for the Child. As her tears fell to the ground, flowers sprang up, which the child gathered and brought to the Infant. As the Baby Jesus touched the flowers, a delicate pink appeared in the center of each one. And so a new flower bloomed—the Christmas rose! It is said that to this day the Christmas rose blooms more abundantly at Christmas than at any other season.

Another version of this legend tells that an angel appeared to the weeping shepherdess and scattered white roses in her pathway, which she gathered into her arms and laid at the manger as her gift to the Child.

The rose and lily have always been associated with the Madonna in story and in art. It is said that the "Rose of Jericho" sprang up on the desert wherever the feet of Mary stepped, during the flight into Egypt.

One of our most beloved traditions at Christmas is that

The Holy Family, when fleeing Herod's soldiers, found sanctuary in a huge, hollow pine.

of decorating a tree. One legend that comes down to us from days of early Christianity in England concerns a monk named Winfred (later St. Boniface) who was helping to spread Christianity among the German Druids in the 8th century. He is said to have halted a group of Thor worshippers at a huge oak tree, preparing to make a human sacrifice as crops had been poor. With his staff he struck down the tree. As the oak fell, it split into four pieces, and from its center there grew a young fir tree, pointing a green spire toward the sky. Winfred turned to the crowd surrounding him and said: "This little tree shall be your Holy Tree tonight. It is the wood of peace, for your houses are built of fir. It is the sign of an endless life, for its leaves are evergreen. See how it points towards the heavens. Let it be called the tree of the Christ Child. Gather about it, not in the wilderness, but in your homes. There it will be surrounded with loving gifts and rites of kindness."

Placing lights on the tree is attributed to Martin Luther over 400 years ago. Walking home on a cold, starry Christmas night, he noticed snow glistening on the branches of a small fir. Taking the tree home to delight his family, he placed candles on the branches to produce the effect of starlit snow crystals.

During the Middle Ages trees with lighted candles were used in connection with Christmas, but they bore no presents.

Bedecking the tree with symbolic flowers, fruits, birds, and other ornaments would seem to incorporate the ancient legend that on the first Christmas Eve all the trees and plants of the forest burst into bloom, and all the birds began to sing, to celebrate the miraculous birth of Jesus.

ANOTHER legend concerning the origin of the Christmas tree tells that three trees grew near the Manger—the olive, the palm and the fir. The olive made an offering of its fruit and the palm of its dates. The fir, having nothing to give but worship, raised its boughs in adoration and the angels hung stars on its branches, thus making it the first Christmas tree.

The first record found of a Christmas tree outside Germany appears in a travel book written in 1604, where mention is made of a tree in Strasbourg. The book tells us that "they set up fir trees in the rooms and they hung on them roses out of many-colored paper, apples, wafers, gilt sugar, and so on." From Strasbourg, the custom seems to have spread over most countries in northern Europe, but there is no record of Christmas trees in England until near the middle of the last century. Prince Albert, the German-born consort of Queen Victoria, introduced it to his children—and England—in 1841.

Hessian (German) soldiers brought the custom to America during the Revolutionary War, where colonists eargerly accepted the tradition. Our first trees were decorated with bits of cotton, strings of popcorn and cranberries, to which through the years we have added other assorted, colorful, glittering ornaments (many treasured objects for the tree are carefully preserved and handed down in families).

After our Christmas tree is all decorated and lighted, it is said that preserving it until 12th Night (Jan. 6) will bring good luck!

In New Zealand, the tree used at this season is known as the "Christmas tree" because of its red flowers that open in December and January.

Pride or Prejudice?

An Editorial

THE black duck (Anas rubripes) is considered by wildfowlers in many of the eastern states to be "King" of ducks. Its breeding grounds range from northeastern North Carolina to the Lake States, the western shore of Hudson Bay to Newfoundland, Prince Edward Island and Nova Scotia and on down to North Carolina. Its winter range extends throughout all states east of the Mississippi, plus half of Arkansas and all of Louisiana.

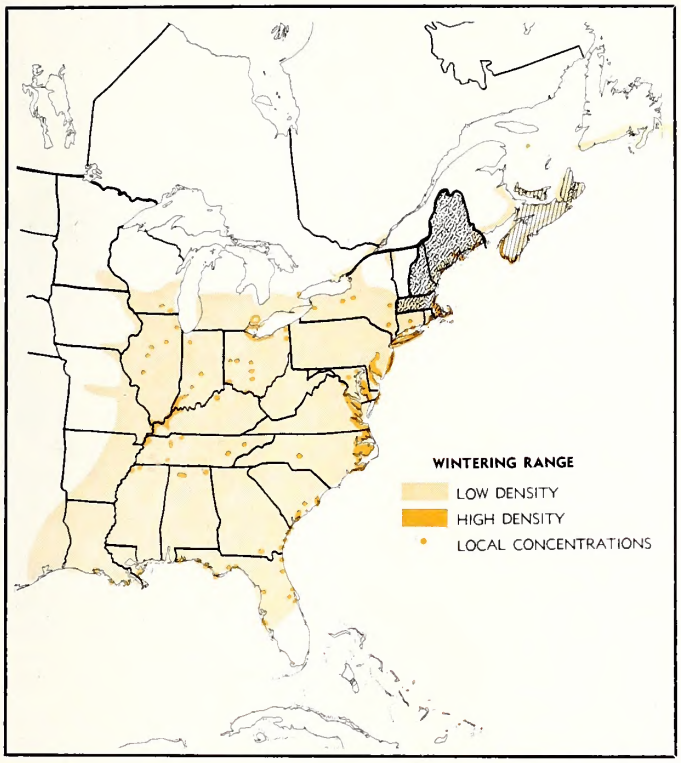
U. S. Department of the Interior 1966 waterfowl hunting regulations for the Atlantic Flyway authorizes framework dates for ducks beginning October 8, 1966, and ending January 8, 1967, and permits each state to select a specified number of days for its season within the framework. The northern section of the flyway generally selects its days early and the southern section late.

In many states the black duck provides most of the best shooting. Part of the flyway population of black ducks arrive in the southern states with other early migrants, but another part appears to require more severe weather to move it southward. Migrating birds from the north provide improvement in shooting as the season progresses and weather becomes more severe.

In recent years, a few of the northern states and the Boston Regional Office of the U. S. Bureau of Sports Fisheries and Wildlife have sought an open season which would permit them to continue to shoot black ducks after their earlier regular season. Of course, this is unfair and diminishes the quality of shooting in states to the south. It violates a fundamental principle recognized in the Migratory Bird Treaty Act and in waterfowl regulations since the very beginning.

Nevertheless, the federal regulations for the 1966-67 season authorize the states of Maine, Massachusetts, and New Hampshire a 23-day bonus shooting season with a daily bonus bag of four black ducks between December 15, 1966, and January 8, 1967, after their early regular open season, and simultaneous with the regular season in the southern part of the flyway.

For Tarheel duck hunters, who have been told that black ducks are in short supply, this is hard to understand. This year we are limited to three black ducks daily, six in possession during a season running from November 14 to January 7. Correspondence contained in "Crackshots and Backlashes" indicates some of the efforts made by the Wildlife Resources Commission to obtain what it considers to be fair and equitable waterfowl hunting regulations based on sound, scientific management principles. These efforts were futile.



The seasonal ranges of the black duck are shown here in color. Prince Edward Island and Nova Scotia, where the season has been delayed are shown in cross-hatching; Massachusetts, Maine, and New Hampshire, where the black duck season has been extended, are shown in grey stippling.

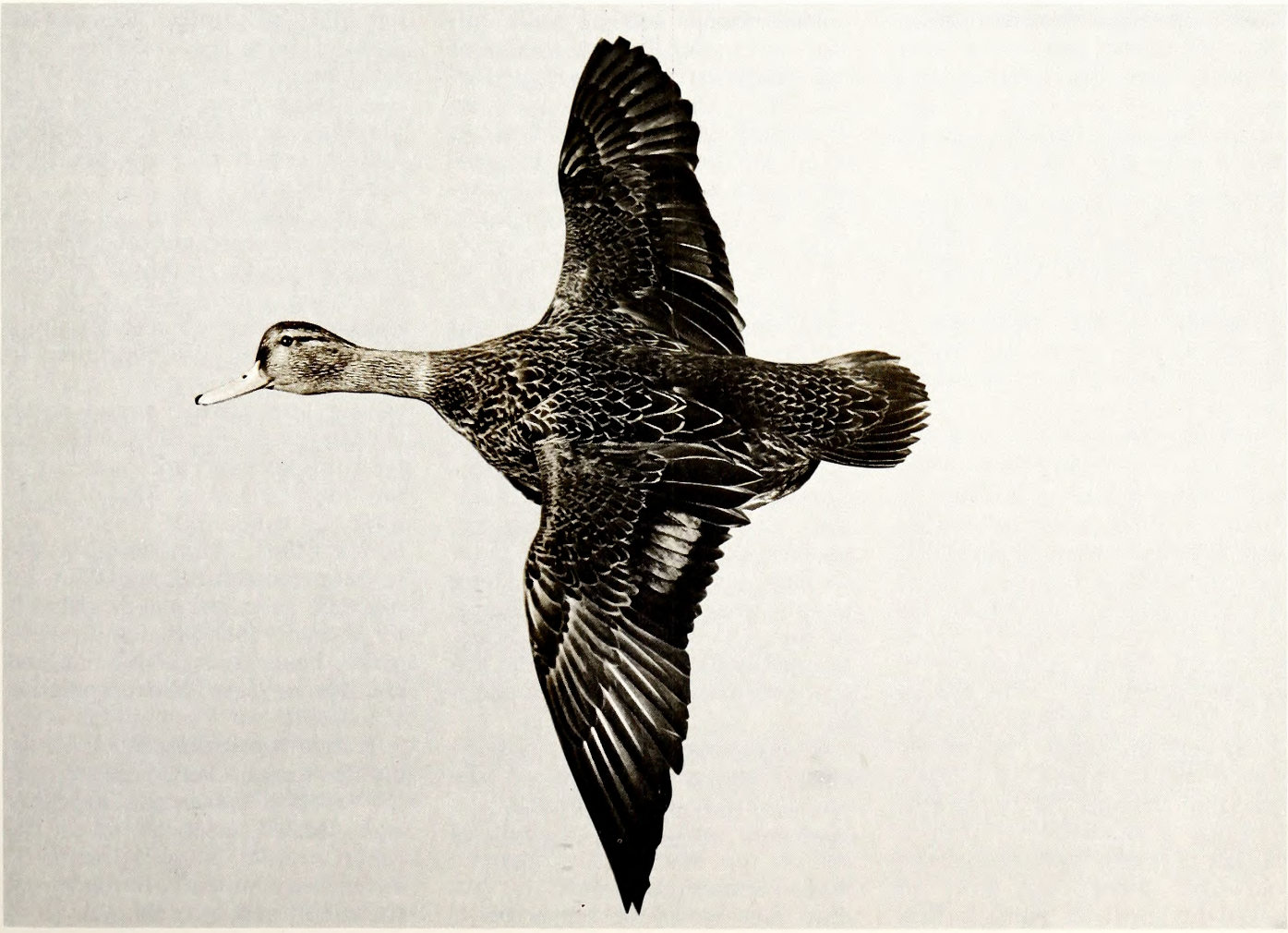


PHOTO BY JIM LEE

ARE YOU ON THE RIGHT TRACK?

by Frank Mooney

THE loose, powdery snow of daytime hardened to an almost solid crust during the long, frigid winter night. During the night I had awakened frequently in anticipation of tracking a restless rabbit that might dare to venture from his warm bed early next morning. The top of the foot-deep snow stayed soft enough during the sub-freezing night to hold the imprint of a big foot cottontail.

The tracker will not usually notice the large feet of a cottontail because seldom is the snow solid to within a fraction of an inch of the surface. When tracking, the imprint of the legs thrust into the snow is the sign most familiar to the tracker.

Tracking animals can be a frequent game for many lucky nimrods to the north of us; but in North Carolina, it's a celebrated treat to get a "tracking snow." I first enjoyed this unique sport at an early age with my father. He taught me when a rabbit track led into a clump of briars or a bramble jungle, to circle, seeing if the clever bunny had continued through the tangle, before we plowed in to make the flush. Tracking animals is enjoyable even for a nonhunter. After a blanket of white has covered the landscape, there's the story of the silent horde of animals that crossed the path before him.

One can learn the well-used crossing of the cunning fox as it enters the ghostly fields to prey on mice, rabbits or most any hapless critter that makes the tiniest mistake. Maybe where a field rat has crossed a meadow strip with its long tail leaving a shallow furrow in the middle of the dainty tracks. Possibly the wing imprint of a sparrow as it lifted precariously into the air because of the soft snow creating takeoff problems.

The tracker will observe that rabbit tracks stick to areas of dense briar patches or heavy foliage and seldom venture to open ground. A brushy fence row is a favorite trail for a covey of bobwhite quail as they cross to another field or feed in the early dawn.

Most tracks left by wild animals are under or near shelter of low brush and the protective forest. After several trips into the glistening winter setting, one can often predict where the mysterious track of wildlife will be before reaching some likely spot.

THE snow plow had cleared the roads except for a thin layer and the constant pounding of chains and snow tires had loosened and softened the ice until the warmth of the sun had melted most of Nature's hazard. I parked my station wagon at an old house, crammed shells into my autoloader, shouldered my camera and went to look for bunny tracks along an old abandoned woven fence. A steep honeysuckle and briar-tangled bank jutted out from the fence to make ideal rabbit country.

Tracks were abundant but too closely spaced to single out one and follow it to the rabbit's lair. Most every track had an identical set on top leading the opposite way. (Sometimes I feel the human race would be better off if we did more backtracking, to see and think about the first road we took, instead of continuing pell-mell down a one-way street.) I cast in a circle like a bird dog loosing a furtive scent, and found no telltale mark of the bunny leaving the dense cover. After moving into the tangle again, I stopped for a moment trying to find a melted spot made by a rabbit's body heat. A brown form about 12 inches from my right boot sprang forward, speeding toward the woven fence and safety. The snow gave in to the rabbit's weight but it raced over the white surface in a fluid motion; at my shot the bunny cartwheeled three feet short of the woven fence.

Rabbits sit tight on a snowed-in day and frequently let the hunter walk within a foot without flushing, unless the hunter stops. I have seen rabbits flush after hunters stop talking. With everything silent the rabbit can't pinpoint the hunter's position, and the span of noiseless time takes its toll.

Earl Blalock and I several years ago were rabbit hunting and glimpsed a cottontail crouched under a thin line of brush. Earl was going to make the jump and clobber it. We continued to talk as I gave my gun to Earl telling him that I would catch it with my hands. Skeptically, he took the gun and got ready for a big laugh. I had no idea of grabbing the rabbit but I would get E for effort. After circling the rabbit a couple of times about ten feet out as it crouched with his large eyes following my every move, I neared its blind side and stepped in close, and sprang for the rabbit.

In mid-air I glimpsed the rabbit leaving the bed, I groped for the rascal and by sheer luck, my right hand clasped around the rabbit's neck. I stood up with the struggling bunny and released the rabbit and took the gun from

Unless prolonged and severe, snow and cold weather rarely harm wildlife. The feeding habits of some species may be affected. This rabbit eats woody bark.

Tracking wildlife in the snow may turn up some surprises. Winter is a good time to observe wildlife and its cold-weather adaptations.

Earl as he stood there in amazement. In silence we then strolled toward more rabbit cover.

After bagging my first rabbit I saw a single track leading to a clump of honeysuckles. Putting my gun down, I eased into the brush with camera cocked hoping to get a rapidly departing rabbit leaving his well-hidden lair. Several crunchy steps later, I reached a brush pile and stepped onto it with my foot with camera in ready position. A rat darted down a melted furrow and disappeared into another clump. Then a rabbit burst from a small opening springing down the bank and out of sight in a few leaps. The camera was pointed the right way but I saw more brush than bunny. If not pursued the rabbit would not go far in the deep snow, so I would get on his track later.

THE first few days after it had fallen, the snow was loosened enough for rabbits to reach the soil and find some food. There was a bountiful crop of poke berry and sumac for animals to feed on. I have watched rabbits feed on poke berries. If necessary they will stand on their hind feet to reach the juicy berries. Rabbits will also eat bark in young trees when other food is scarce.

I had dropped several ears of corn into my hunting coat before starting the hunt. After reaching the lower end of the field I found where a covey of quail had crossed the fence row. I scattered corn in a long line before continuing on. It is unlawful to hunt bobwhite quail and turkey where I live while the ground is covered with snow.* Rabbit tracks were thick in the corner of the field, but all tracks led back into a pile of impenetrable briars and logjams. Those rabbits were safe.

Birds had scratched around young pines where the branches had reached the fallen snow. Weed seeds had been gathered where the snow had pulled the stalks over in a misshapened fashion. Birds had gorged on poke berries and sumac and the red droppings were evidence showing bright on the white surface. It was a beautiful setting and great to be outdoors. I had not seen another hunter or human track to tell that the animal world had been invaded. This was a grateful change compared to the hustle and bustle of normal days during the first of the season. Then one wonders if the jaunt he is taking has already been vacuumed by some other hunter's cold nose bird dog.

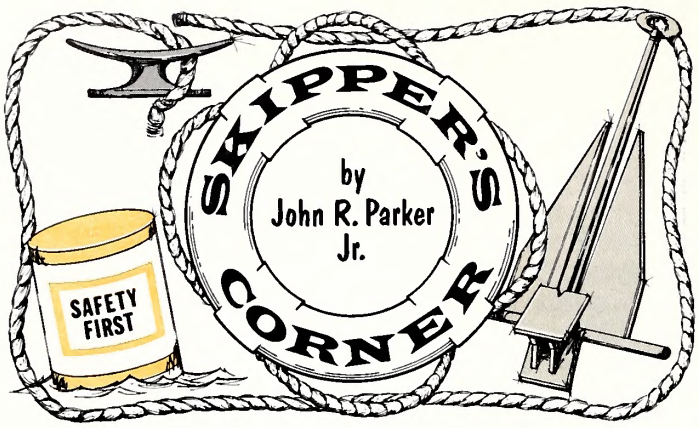
At length, I crossed into another rested field that had given way to shoulder-high weeds and briars thick enough to hinder an elephant. Once more on the fringe of the thicket I saw imprints telling of a cottontail's woodland adventure. The tracks were woven through the maze tangle; it took 20 minutes of trodding to locate the almost-covered bunny. The opening was large enough to expose part of it's head. I crouched at the entrance with camera cocked and adjusted. The rabbit sailed out the opening heading for denser cover. The gun and camera straps became tangled during the hasty exchange of camera and gun. Luckily, I got off a fast but true shot just before the critter disappeared.

The deep snow was taking its toll of my energy, and my labored breath showed white in the frosty air. After a brief rest, I continued to the forest edge where squirrel tracks told of the nutcrackers trek in search of food. Tracks of another covey of quail criss-crossed with their middle and longest toe making a continuous trail to each imprint. The crossing tracks in the white unbroken surface reminded me of a crossword puzzle.

Cardinals, field sparrows and flickers were perched in pokeberry bushes busily gorging on the red fruit. Most rabbit tracks were visible in the dense briars, but following a single track was impossible. I found three beds that rabbits had made but failed to find the maker. One rabbit had a burrow leading from his bed and I prodded the burrow, but no bunny.

TRACKING in the snow is thrilling and enjoyable; one can see where elusive nocturnal animals spend most of their active time, while you have a chance to bag a bunny in the bargain. The uncrowded conditions alone are worth the trip. When tracking rabbits, try the grown-up fence rows and dense briar and bramble jungles. Most rabbits retreat to heavy cover to wait out the storm. Always check the morning after a snowfall; but usually after a deep snowfall the activity does not start until the second night when cold hind parts and hunger pains spur the animals into action. But should they move the first night, the tracks are easier to follow before numerous tracks help blot out the one you are seeking. Even when tracking a bunny the morning after the snowfall, it's still easy to stop, confused and wonder to yourself "are you on the right track? . . ."

*Check page 11 of the 1966-67 Hunting and Trapping Regulations.



UNIFORMITY in state boating regulations a must? Uniformity in laws across the nation regulating pleasure boating equally desirable? The answer to both of these questions must be, with rare exception, yes. The next question might be—why uniformity? But even before that, we might go as far as to ask why must we have boating laws anyhow, uniform or otherwise. True, this is a deep subject for frosty December, but let us pursue it. Soon a new year of boating will begin and during the new year we will no doubt see new laws passed by the 1967 law makers.

The safety of the boat operator and his passengers should be the prime consideration in the formation of new regulations and/or laws. This was the plan behind the State Boat Act of 1959 which was modeled after the Federal Law or Bonner Act. Now, it may be most difficult to prove that the primary purpose of a safety law is being achieved. That is, has it saved lives? Seldom do new safety laws result in drastic reductions in fatalities or injuries. However, since boating accidents have not been increasing at an abnormal rate relative to boating activity, we can assume that the safety act had a desirable effect.

Other reasons for boating regulations would be to prevent property damage, control traffic etc. But this type of thing eventually leads back to the prime business of saving lives and preventing injury.

Yes, it takes money. And the registration program does finance the boat act. But registration does more than just provide for revenue. Enforcement and administration of the act consume a goodly amount of the revenue collected from registration. Boating safety education is also financed from these funds. And as with many programs, bonus benefits are later added. The boating access area program (launching ramp) is now partially financed from registration revenue. Also there are additional values in the program, examples of which are: the protector or boating law enforcement officer becomes a search and rescue worker when the need arises; the registration number helps in the search for a stolen boat or in finding a hit and run operator and the education program offers useful information in addition to pure safety information.

After all is said and done you feel that you were safe enough without the boat act? Perhaps, but as long as people are injured and killed in the activity of boating or in any other activity, law makers and interested citizens and government employees will attempt to do something to remedy the situation. That's the way it is in our form of government and part of what makes it a pretty fine system.

Granted, occasionally there is an attempt to regulate that which has not yet been regulated simply for the sake of regulation. Hopefully, this will remain the exception rather than the rule in regard to boating.

How do we get our safety laws? Sometimes, they come about because an individual or group thought it to be just a "good idea." Some are developed for convenience. Some come about because of the "do something even if it's wrong," attitude. But mostly because we just don't like to see people get hurt. We are trying to be humane. In this desire we may go off the deep end and over regulate. But here is where communication and true cooperation and understanding between you, the boater, the administrator, the enforcement officer, and the law maker acting as one can become sort of a water umpire.

Uniformity then, (still here, awaiting discussion) ties deeply in with the 1959 Boat Act because: (1) the various states used a model act as a basis from which to set up their programs, (2) it is a statewide law (with equal justice for all, you might say). In the final analysis, there is considerable variation among the states concerning equipment requirements, what's to be registered, etc. (Most of the variations go beyond minimum requirements). Ideally, the states should drift closer together in this and such is worked toward through the National Association of State Boating Law Administrators of which this state is a member.

The pleasure boating masses, the trailer sailors, are nomadic. While they may use a particular body of water primarily, there is a good chance that they will trail their boat across the state sometime during the season. The trip may even be to another state. Here then, another reason for uniform regulations.

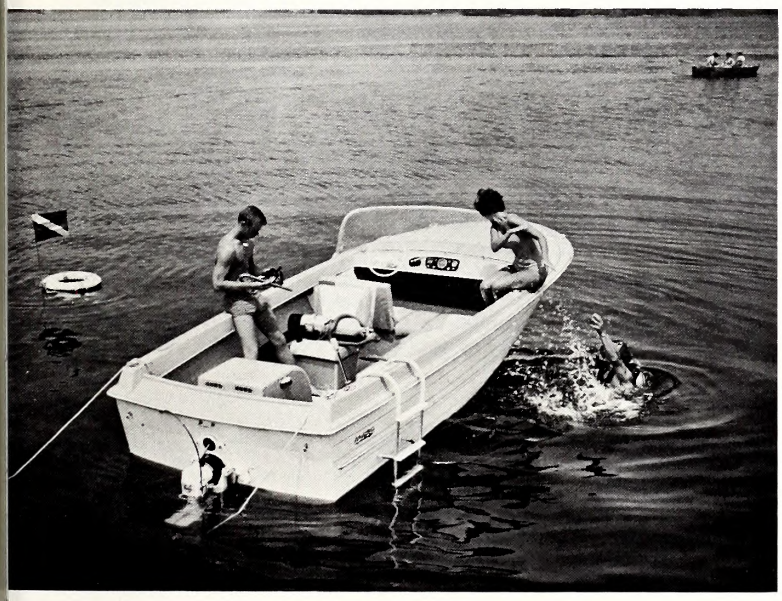
The basic ingredients for safe boating are about the same for a piedmont lake as they are for Carolina coastal waters; another good reason for keeping boat regulations uniform on a state-wide basis. To have existing lakes and any new lakes that may be developed end up with differing regulations would simply confuse you, the boater. I don't believe you want this. I don't believe you want to carry around a directory of laws of the different lakes in order to boat within the law.

Is there danger of this occurring? Possibly, because for every lake with a safety problem, there will be proposed any number of regulations. And unless uniformity (statewide) is kept in mind, the hodge-podge regulation situation could develop.

Once a body of water has been declared state or public, it is just that. While local interests may wish to initiate proposals and take the lead in de-

veloping safety councils, etc., the water is still for the use of all the people and in this writer's opinion should not be regulated to suit the desires of a few. (Most streams, rivers, lakes and, of course, coastal waters are considered state or public and are so treated).

If there is a possibility of confusing regulations, there is also a danger of more pressure on the boater's budget. Among the various proposals that may stem from a safety problem is the desire for local boating commissions or boating authorities which in turn may need revenue. If this approach gets started (the situation has occurred on one lake already), we fear from this Corner that boaters will need, in addition to the state registration, a license or certificate of admission to each of the lakes in the state. If there is anything that should remain tax free, it is public water, be it a river that has been modified into a lake, an unspoiled river or a sound.



Waterway markers are designed to aid the boater, and to make his sport safer. Above, a skin diver's flag warns other craft away. The water skier has a responsibility in safe boating, too. Note the observer watching the skiers. Operator looks ahead.

PHOTOS BY EVINRUDE MOTORS

If, then, you find yourself in a group proposing certain regulations or if you request this of your elected representatives, the following facts will be of interest to you.

- There is now a statewide boating law (Boating Safety Act of 1959) that is applicable to all public waters including municipal lakes, the ocean, etc.
- Wildlife Protectors are the primary enforcement officers under this law and the boating public has generally recognized these officers as doing a fine job. (Sheriffs, highway patrolmen, city police, are also authorized to enforce the boat law.)
- In 1965, the boat law was amended to include a Uniform State Waterway Marker System. All markers placed on public water must conform to the system. Again, uniformity enters the picture. You would want a control measure presented to you the same on Lake Fontana as it is on Currituck Sound. Along this line you also would not expect individuals to mark off a part of public water for their individual use.
- The U. S. Coast Guard and the Wildlife Resources Commission share responsibility for enforcing the boat law on navigable waters. This includes, for the most part, our coastal waters and certain inland waters declared navigable, Fontana Lake, Kerr Lake, etc.
- Many states have elected to apply to the boating program the monies received from tax on fuel used for marine purposes. Needless to say, such a move would truly enhance the boating program in this state.
- Ten counties, several coastal, remain exempted from the life preserver and light requirement on boats of under ten horsepower. Have these people been drown proofed?

What does all this add up to? First, we have an adequate boat law—not perfect, but adequate. It needs polishing up in places and we may see this in the months ahead.

Uniformity is needed in regulating, marking and enforcement. We surmise that this was one reason the legislators put the primary enforcement responsibility under one organization. In this way, there is uniform and fair enforcement of the law.

North Carolinians have now experienced some six years with a state boat law. Most boaters have learned and obeyed the law; some have criticized it; protectors, administrators, citizens and law makers have seen ways to improve it. We now have experience, we have had problems, success, have seen growth in boating and have added a marker system. We may now be at a critical point upon which the future of a smooth running system depends. Improvement to the program will be suggested to the 1967 Legislature from various sources including the Wildlife Resources Commission. Let us hope all of the laws adopted will ultimately end up as improvements with the prime purpose of saving lives and bettering this recreation as the justification for their adoption. ⬍

BIRDS OF PREY

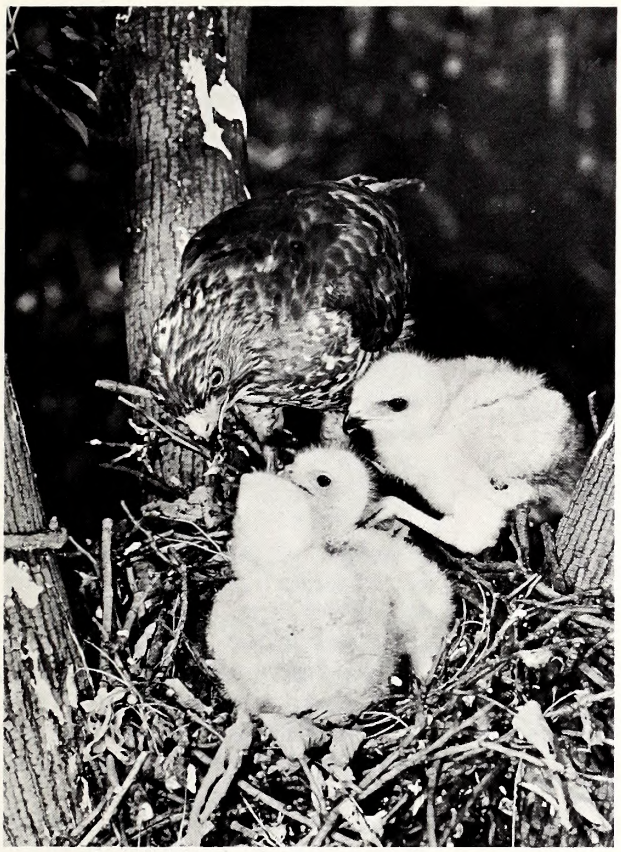
Photos by Karl Maslowski
Text by W. L. Hamnett

The BALD EAGLE (left) needs protection as never before. Will you come to his aid? The small PIGEON HAWK (above) visits us during the fall and winter months along the coastal migration routes of shorebirds, sparrows, and warblers. It has a wildness of few other birds, and its flight is one of spectacular beauty.

Though it takes its toll of small song birds, the SHARP-SHINNED HAWK tends to capture those birds that are weak, diseased or less wary, thereby removing a potential danger to other birds.

If there is such a thing as a "bad hawk", the COOPER'S HAWK is perhaps it. Its take of quail is light, though; perhaps as many in a year as a hunter takes in a day.

The SPARROW
the most beautif
grasshopper haw
quantities of the



The little BROAD-WINGED HAWK, seen here feeding her young, spends much of its time sitting quietly among branches of trees in our woods. Its diet includes mostly insects, and especially large, destructive caterpillars.

This animated mouse trap is a decidedly beneficial bird because of the emphasis it places on mammalian food. The RED-TAILED HAWK is essentially a soaring bird and is usually the large hawk we see gliding overhead.

s our smallest hawk, and ight be better be called se it destroys enormous uctive insects.

Cases have been known where RED-SHOULDERED HAWKS nested for years within sight of poultry farms without taking one chicken. They eat harmful rodents.

The PEREGRINE FALCON or duck hawk has the sporting qualities of speed, power and courage. It is the bird of the Age of Chivalry, the bird of falconry.

Wild Game for the Table

by Duane Raver

THERE'S nothing quite so bad as poorly prepared wild game. Much of the game bag's contents that end up in the garbage can, could just as well have made plenty of good eating; chances are that it wasn't the fault of the bird or animal. Preparation of the day's kill for the table should begin very soon after the quarry is downed. There are proper procedures for cleaning, transporting and storing wild game. It may take a little more time at the end of an already long day, or even a few minutes after each kill to make sure that the meat arrives home in good condition. And no amount of cooking know-how will cover up the taint of mishandled game.

You may have your own methods for taking care of the kill, but a few basic rules that have worked for most hunters include these: For big game, such as deer, bear, and boar, bleed, draw and clean thoroughly immediately after killing the animal, and cool the meat as soon as possible. The body cavity should be held apart by a stick and the animal should be hung up by its hind legs or antlers (opinions differ on hanging "up" or "down"). Also you find that some prefer the hide on, while some prefer to skin the critter at once.

Transport the animal in as cool condition as possible. Aging often helps the taste considerably and this should be done in a cooler or in the open air where the temperature ranges between 36 and 40 degrees. Make sure insects do not have access to the carcass. A week's aging will firm the meat on most young animals, while it may take up to three weeks for an old buck deer. After aging (unless you prefer to do this sooner), remove the hide carefully. Butchering may require the attention of an expert meat cutter, or you can get a "beef cut" chart and proceed on your own. Cut and wrapped pieces should be stored at 0°.

Small game such as rabbits and squirrels require attention too, if they are to reach the table at their best. Take time to draw, clean, and skin the animal as soon after it is killed as possible. And keep it cool right from the start. Most small game have scent glands under the forelegs and along the spine in the small of the back; these should be removed as you clean the animal. Be careful not to cut into these glands. If temperatures permit, transport in open air and refrigerate a day or so before cooking the game. Some prefer to soak the meat in weak salt water a few hours prior to cooking, but the use of moisture otherwise should be done carefully, and the meat should be dried thoroughly before wrapping or transporting. Moisture aids spoilage.

Upland and migratory game birds often receive the worst treatment of any game and are expected to taste the best. The secret to tasty eating is usually preparation long before the kitchen comes into view, although the diet of some ducks may affect their flavor. Pluck the birds while still warm, if possible and this will prevent excessive tearing of the skin. Draw and clean them and place them in a cool place at the first opportunity. The oil sac at the base of the tail of waterfowl may seep out strong elements that will affect the meat, and this should be cut off as soon as the bird is downed.

Paraffin melted and placed in a deep container is sometimes used to remove the fluffy down from the waterfowl. Dip the picked bird in and out of the liquid and let it cool for a few moments, and then peel it off. Most of the small pin feathers and down will come with it. It's worth a try.

But what about cooking these bounties of Nature? Let's take venison for a starter. Centuries ago when most of the game was captured after a considerable chase, the term venison meant just about any animal and even bird, so captured. Today, it is pretty well limited to the deer and its relatives.

Most deer don't stand around long enough to accumulate much fat! Hence the meat is on the lean side and fairly dry. And it takes added fat in preparation to help the texture and flavor. However, deer fat as a rule is strong, and fat salt pork should be substituted for the deer's fat. Over cooking also will add to the flavor and texture problems, and rare or medium rare venison is best.

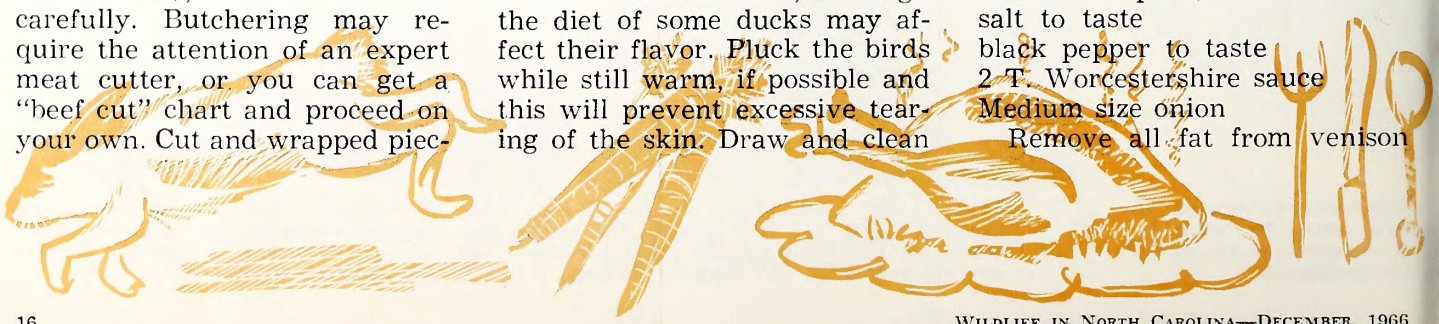
• Here are a few recipes that sound good. These are from the *Meats Edition of the Favorite Recipes of American Home Economics Teachers,* published by Favorite Recipes Press, Inc., Post Office Box 2015, Montgomery, Alabama.

Venison

Venison Roast

Number of servings 10-12
4 to 5 lb. venison roast
2 lemons
6 slices salt pork, ¼" thick
salt to taste
black pepper to taste
2 T. Worcestershire sauce
Medium size onion

Remove all fat from venison



roast. Season with salt and pepper. Line a roast pan with salt pork that has had excess salt washed off. Place roast in pan. Add the juice of 1 lemon, Worcestershire sauce, chopped onion, and slices of other lemon. Cover and cook slowly until done. Add a small amount of hot water if needed.

Pan-fried Venison Steaks

Number of servings 4
1 lb. "ham" steaks, ½" thick
¼ c. thick cream or evaporated milk
¼ c. flour
3 T. butter or margarine
Salt and pepper to taste

Pound steaks thoroughly with sharp-edged meat pounder. Cut into serving pieces. Dip steaks into cream, dredge in flour. Brown one side in hot butter. Turn. Salt and pepper to taste. Continue browning until second side is well browned. Serve hot.

Swiss Venison

Number of servings 4
4 venison chops or 2 venison rounds
Salt and pepper
Flour
4 T. cooking oil
1 large Bermuda onion
1 can tomatoes
1 can water

Salt, pepper and flour the meat. Brown side in cooking oil. Add onion slices, tomatoes and water. Simmer about 45 minutes. Serve with rice.

Rabbit

Rabbit In Wine

Cut one rabbit into serving pieces. Brown on all sides in hot oil. Salt and pepper. Add 1 cup red wine, 1 clove garlic, 1 teaspoon chopped parsley and ½ teaspoon rosemary. Cover and simmer until meat is tender, from 45 to 60 minutes.

Fried Rabbit

Number of servings 2-3
1 small rabbit, cut in serving pieces
Salt and pepper
⅛ teaspoon crushed oregano
2 tablespoons milk
1 egg
¼ c. flour
½ cup fine dry bread crumbs

Sprinkle each rabbit piece with salt, pepper and oregano. Combine milk and egg; beat slightly. Dip seasoned rabbit in flour, then in egg mixture and lastly in bread crumbs. Brown them on all sides in ½" fat heated to 375° on deep - fat thermometer. Reduce heat. Cook 20 to 30 minutes or until tender. Drain on absorbent paper. Serve with corn pudding, Waldorf salad, hot biscuits.

Squirrel Chowder

Number of servings — according to guests
2 squirrels
Chicken pieces
1 lb. cubed beef
1 c. celery pieces
1 can corn
2 medium onions
1 can tomato juice
1 can green beans
4 potatoes, cubed
3 carrots, sliced
1 can peas
Seasoning as desired

Combine meats, celery, corn, onions, salt and pepper. Cover with water; cook until almost tender. Add tomatoes, green beans, potatoes, carrots and peas. Cook until tender. Remove bones and serve to hungry hunters or their appreciative families.

Brunswick Stew

Number of servings 6-8
3 squirrels, cut in serving pieces
3 qts. water
¼ c. diced bacon
¼ teaspoon cayenne
2 teaspoons salt
¼ teaspoon black pepper
1 c. chopped onion
2 one lb., 3 oz. cans tomatoes, drained
2 cups diced potatoes
2 cups lima beans, fresh or frozen
2 cups corn, fresh or frozen

Place squirrel pieces in a large kettle. Add water. Bring slowly to boil; reduce heat and simmer 1½ to 2 hours, or until squirrel is tender, skimming surface occasionally. Remove meat from bones and return to liquid. Add bacon, cayenne, salt and pepper, onion, tomatoes, potatoes, and lima beans. Cook one hour. Add corn and continue to cook ten minutes. Spoon into soup plates and serve with corn bread, cole slaw.

Quail

Hot Quail Pie

Number of servings 4
3 medium size quail, dressed
Salt and pepper
1 small can green peas
1 c. cooked, diced carrots
Small recipe of buttermilk biscuit
3 T. flour
1 small onion
2 T. butter or oleo
Few drops tabasco sauce
1 t. Kitchen Bouquet

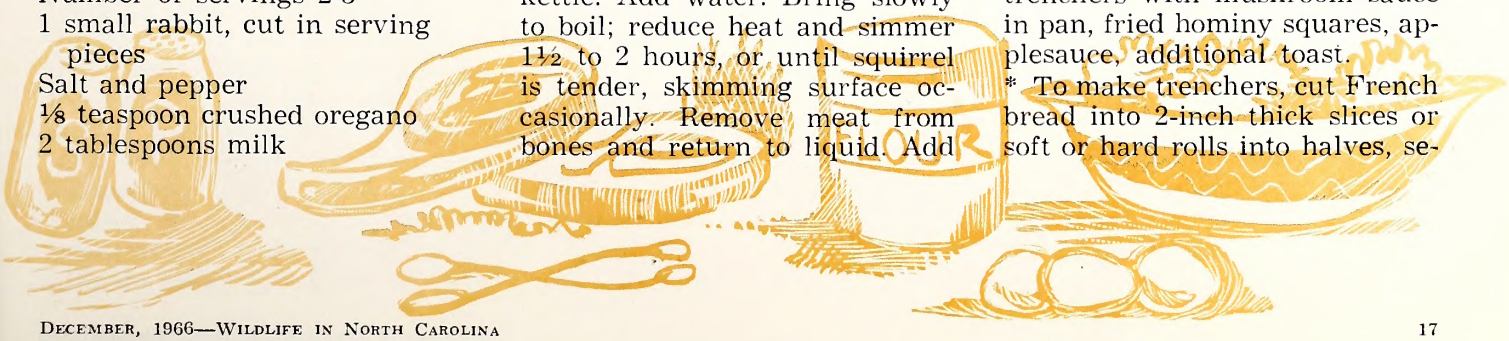
Cook quail in about 4 cups water with salt and pepper to taste. Save liquid. Pick all meat from bones and drop in liquid, set aside. Saute onions in oleo until tender, add flour and stir well. To this add the quail pieces and liquid, tabasco sauce and Kitchen Bouquet. Cook over low heat until thick. Add carrots and peas and pour into deep baking dish. Place freshly made biscuit on top and place in oven (375°F.) and bake 20 to 30 minutes. Serve hot.

Brunch Quails

Number of servings 4
4 quails
Salt, pepper, flour
¼ c. butter
½ c. water
6 small mushrooms, sliced
2 T. chopped parsley
4 buttered toast slices or trenchers*

Sprinkle quails inside and out with salt and pepper and flour. Melt butter in a skillet; add quail and brown on all sides. Add water and mushrooms. Cover and cook over low heat 10 minutes. Add parsley, cover and cook 10 minutes longer, until tender. Serve on buttered toast or trenchers with mushroom sauce in pan, fried hominy squares, applesauce, additional toast.

* To make trenchers, cut French bread into 2-inch thick slices or soft or hard rolls into halves, se-



lecting bread or rolls slightly larger in size than a quail. Scoop center from each to make cup to hold bird. Butter and toast lightly.

Dove

Dove In Blanket

2 dove breasts for each person. Rub breast with salt and pepper. Wrap with a strip of bacon. Fold each wrapped dove breast in aluminum foil. Place in baking dish. Cook 2 hours in 300°F. oven. Serve hot with steamed wild rice, generously buttered. Garnish with parsley and pickled crabapples.

Broiled Dove Breasts

Number of servings 4
12-15 doves, depending on size
12-15 bacon strips
Butter

Placed cleaned doves, breast side up on broiling pan or in pyrex bowl. Slice breast meat parallel with breast bone once on each side. Insert a slice of butter into each slit; salt and pepper; use garlic salt, if desired. Wrap each bird with slice of bacon. Broil about 5 inches below heat until done—approximately 20 minutes. You may leave bacon on bird or unwrap it. Bacon and butter help dove meat have a juicier texture and covers up wild taste. Gravy may be made with drippings.

Ducks and Geese

Roast Duck and Cumin Rice

Number of servings 6
1/3 c. chopped onion
¼ c. diced green pepper
2 T· bacon drippings
1 c. uncooked rice
2 10½ oz. cans consomme
1 T. Worchestershire
3/4 t. salt
3/4 t. cumin seed

Rice—In a 3-qt. container, on medium heat, saute onions, pepper and rice in bacon drippings until golden brown. Add consomme, Worcestershire, salt, and cumin seed. Cover with tight lid, bring to a boil. When steam escapes, turn burner low and cook for 20 minutes.

Duck — Soak ducks in salted water ½ hr. Dry and rub with salt and black pepper. Stuff with onions, carrots, apples and celery. Cook in 400°F. oven.

Fried Wild Duck

Number of Servings 6-8
2 or 3 ducks
2 T. cooking oil
½ c· celery (chopped)
½ c. bell pepper (chopped)
1 c. onion
3 cloves garlic

Clean duck well and dry; chop celery, bell pepper, onion and garlic. Mix well. Make 2 incisions in each side of ducks breast. Bathe ducks inside and out with Louisiana Hot Sauce. Stuff mixture in incisions and leave in refrigerator overnight. Heat oil in heavy skillet. Put ducks in and cover. Cook at low temperature until they quit steaming (about 30 minutes). Add 2 cups hot water and cook about 2 hours. Thicken gravy. (The ducks are not pepper hot.)

Wild Goose

Number of servings — 1 to 1½ lbs. per person
1 wild goose
4 slices bacon
2 apples
1 onion
2 celery stalks
Bacon drippings
Salt
Pepper

Rub inside of bird with salt and pepper. Stuff loosely with sliced onions, apples, and celery. Truss bird if large. Brush bacon drippings lightly over entire body. Sprinkle pepper generously over breast and body. Place 3 or 4 bacon strips over the breast. Cover exposed part of bird with aluminum foil. Pour 2 cups water into roaster. Roast at 300° to 325°F. for 15 minutes per pound until tender. Baste frequently. Remove foil when ready to brown. Remove stuffing and serve.

What About the Catfish?

by Duane Raver

IT'S safe to assume that better than 50 percent of those who will read this article have an opinion about the "catfish", and in many cases the opinion is a rather strong one. We even go a bit further with our assumption and say that the majority of the strong opinions are not in favor of the catfish in any form. Thus we are confronted with a slightly prejudiced audience to begin with. Since at least part of this predetermined attitude comes from simply a lack of information or having misinformation, this discussion is aimed, in part, at providing the best available data, qualified opinions, and factual figures on this subject.

First of all, it might be well to review just what the catfish are, as a group. The freshwater catfish are listed under the family Ictaluridae, which includes some 24 individual species. The saltwater catfish (with which we won't be involved here) are two species listed under the family Ariidae. In North Carolina, we have seven of the species which are of interest to the angler and several of the smaller species generally known as "madtoms."

One difficulty arises with names, since we have lumped all these, big, little, fat, thin, good and bad, under this one name, catfish. Since these differ greatly in qualities from species to species, the "bad" ones may have given the "good" ones their besmirched name. Yet they do have many qualities in common, similarities in appearance, and overlapping habitats. But in order to clarify the situation and bring a bit of order out of confuson, names must be used, and species identified.

In other words, a catfish is not simply a catfish. And the sooner we separate the usable cats from the ones which we possibly should discourage, the better. At the moment, there is little question that most fishermen don't think much of any of the catfish. Yet those who work with the fish, keep a biologic finger on the pulse of Tarheel waters, have quite a different opinion. Some of the indignation stems from misconceptions such as "catfish eat quantities of fish eggs"; actually they probably don't consume as many fish eggs as bluegills do under the same conditions. And this egg-eating habit shouldn't be tacked on to all catfish as a group, anyway. Until recently, not much was actually known about the food habits of the catfishes. Even now we base opinions on only scattered studies.

But we can say that very few deficiencies in game fish populations have been traced to predation by catfish. We do know, however, that the catfish as a group (some species much more than others) do eat the same foods that many game fish eat. In other words, there is always the possibility that catfish will compete with game fish for food, and possibly, space.

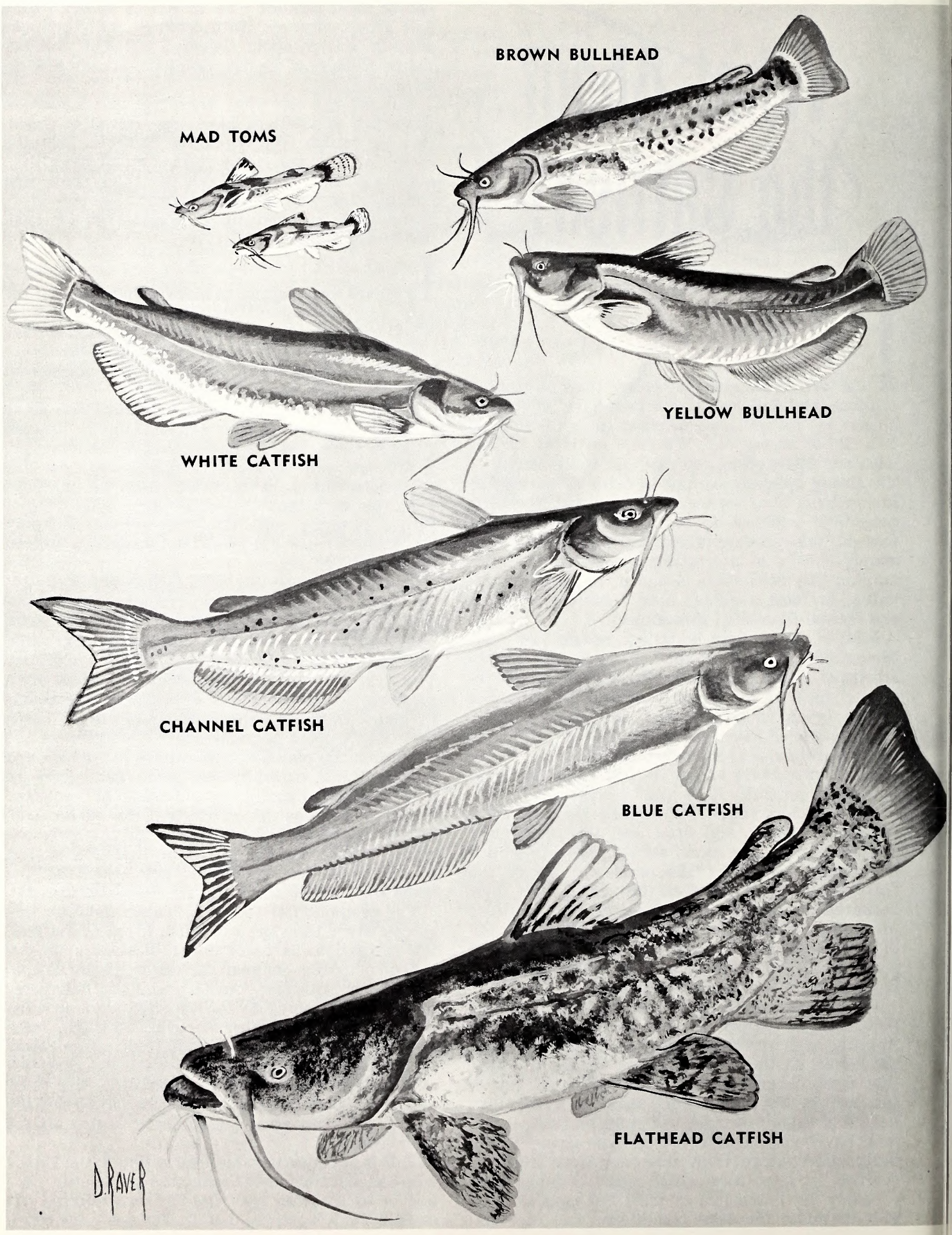
IT comes as a surprise to many fishermen that the "big four" of the catfish—channels, blue catfish, white catfish and flatheads, eat much of the same items as largemouth bass. No sewage? No refuse from the garbage dump? Generally not, unless that is all they can get.

Right about here it becomes necessary to make a major division in the catfish family. We are going to place these four—the channel cat, blue cat, white cat, and flathead, in one group, and the bullheads—the yellow, brown, and flat bullhead (and the black bullhead, where he's found), into a second category, and lump the rest as madtoms. So, when we say "catfish", we mean any one of the four listed, etc.

Taking the State as a unit, catfish and bullheads are quite abundant; and the madtoms fairly numerous, but seldom seen or utilized. Sheer numbers, however, don't make the catfish any the more popular—particularly with the sports fisherman. The term "unexploited populations" crops up when speaking about the catfish. This simply means that in many waters having large numbers of them, they aren't being harvested to anywhere near the maximum. To pinpoint cases where the catfish and bullheads are crowding out game fish might be a bit difficult. Usually, investigation of suspected situations such as this reveal that the habitat conditions are much more favorable for the more tolerant catfish than for the game fish. The catfish moved in as the conditions got worse for the game fish, rather than driving the game fish out.

The promotion of the term "rough fish" for any species other than the game fish listed in the fishing regulations is unfortunate. It does a serious injustice to the channel catfish in particular, to lump them with carp, suckers, and the like. They simply don't belong in the same class. Yet, when we speak of "rough fish removal" as a fish management tool, the catfish must ride along. Most fishery biologists agree that it would take considerable looking to find where game fish habitat or game fish populations could be enhanced by the removal of even great quantities of catfish and/or bullheads.

This is going to sound a little strong to the angler who has just come home without a strike after casting for bass all day and who has seen nothing but catfish. Yet it is not the catfish that needs the repri-


BROWN BULLHEAD
MAD TOMS
YELLOW BULLHEAD
WHITE CATFISH
CHANNEL CATFISH
BLUE CATFISH
FLATHEAD CATFISH
D. RAVER

mand, but rather the forces which changed or created the habitat favorable for the catfish and other non-game species; look for the stream or lake *polluter*, the *poor soil manager*, the *water spoiler*. We perhaps should consider ourselves fortunate to have a group of fish having the qualities of the catfish—fish which will come in and fill in an otherwise vacant niche in the aquatic habitat. There even may be spots where the catfish should be encouraged, promoted, and yes, stocked. Concepts are changing.

WE said that the catfish's numerical abundance seldom insured or even enhanced his popularity—unless, that is, this is just about the only species in a particular piece of water. Where game fish are in short supply or totally absent, the catfish rates high, simply by default! Yet it is the same fish. A weekend gardener once said that if it weren't for the weeds in his front lawn, he wouldn't have any grass at all! A bit quaint perhaps, but applicable when we transfer it to the catfish. Naturally, we might expect that where game fish were in fairly good supply, the fisherman can choose the fish he prefers, and not many prefer catfish when anything else is available.

Yet, in waters where a wide selection of fish is available to the angler, we have a tiny, but consistent group that fish exclusively for the catfish, in these cases, channel and white catfish. We can be sure that a few derisive snickers are now being spouted over that one!

Consider for a moment the channel catfish, a species as totally different from the bullheads as trout are from creek chubs. The channel is anything but a "scavenger", and usually feeds on minnows, crayfish, insects, and other live prey. Unless you've hooked and played a sizable channel cat, no amount of descripton is going to be very effective in convincing you of this fish's gameness. They will often hit artificial lures when the water is clear, they are strong, determined fighters, and hold their own in most competition with the so-called game fish.

And it will sound completely silly to many to say that the quality of channel catfish meat is comparable to bass, walleyes, and may even come a close second to trout. We have all eaten catfish (even channels) that were evil tasting and rank. Think back; what type of water did the fish come from?

This sketch of most of the more abundant catfish shows their physical differences and similarities. The group known as madtoms contain the smallest of the family, with few species exceeding six inches. The ponderous flathead, native to a few western North Carolina river systems, is the largest, with a maximum weight of over 100 pounds.

It is hardly the fault of the fish that the dye plant all but asphyxiates the river with its effluent; that raw sewage gushes into the river above the catfish's home. Any such pollutants will taint fish flesh—even flounder, if they happen to be around.

In other words, to believe that channel catfish, white catfish and blue catfish are inherently foul-tasting is to ignore the truth. Even the "lowly" bullheads make good eating if they come from fairly clean water and are properly prepared. To be sure, this is one key to the tastiness of the catfish, or any fish, for that matter. We might take a moment to suggest some preparation techniques for the whisker fish.

Even before they are cleaned for the pan, care should be taken to keep them fresh. One of the best ways to insure this, is to keep them alive right up until the time they are cleaned. If you can't do this, by all means place them on ice or at the very worst, in a cool place. If you've never cleaned a catfish, you will find the procedure a bit different from most other fish, but certainly not much if any, more difficult. Unless the fish are exceptionally small, fillet them. Skin the fish first or cut off the fillet first and then remove the skin with the blade of the knife. Much of the objectionable taste of any fish is caused by using meat along the belly and some along the backbone. Use only the fillets, and you'll have boneless, tasty eating.

FOR some time, catfish and bullheads (the latter, only in spotty ways) have been taken commercially in various types of gear over the state, and have commanded some fairly fancy prices. It is rather strange that folks will pay a high market value for the catfish and then shun him altogether when it comes to hook and line angling. Baited and unbaited catfish baskets are effective for catfish as are trot lines in most waters. The channel and white catfish are the two most sought after species and often are shipped alive to city markets hundreds of miles away.

In some isolated sections, commercial fishing for catfish is very heavy and the catch is measured in thousands of pounds annually. Yet, with all this rather intensive and extensive fishing, the population of catfish remains consistently high and relatively unexploited. Most fishery studies indicate no apparent reduction in catchable catfish. This should mean that we could harvest more of this resource and still have plenty of brood stock.

The case for the catfish is clear: he is a misunderstood, falsely accused, unjustifiably maligned fish; one which should be harvested and utilized and even managed more intensively. The fish are here, and likely here to stay; why not give them a chance on sporting tackle and then on the table? Whether or not you agree with the movement toward placing the channel catfish on the game fish list, you should approach the situation with an open mind. Perhaps the most difficult step is the first bite!

From A Waterfowler's Notebook

HOW fast can a dove fly? How far can a deer jump? What is the best turkey call? Every sport has these special topics that make for good fire-side conversation. Waterfowling is no different. Presented below are a few facts and a few opinions that you may wish to give thought to when the birds aren't moving. John R. Parker, Jr.

- Shot pellets that miss can later kill your limit of ducks and more. Shallow water ducks, especially, ingest these lead pellets which can be fatal. Shot-shell manufacturers are working on pellet material that will not have a poisonous effect on waterfowl.
- Federally-subsidized wetland drainage programs continue to destroy native wood duck habitat and bottomland wintering areas for migrant mallards, blacks and wood ducks.
- Impounding certain types of salt marsh to about 20 inches of water as opposed to ditching and drainage has proven an effective method of mosquito control and at the same time offers excellent new waterfowl habitat.
- Waterfowl, mostly blue-winged teal, begin arriving in late August. The mass movement out of the state for many species is in late February and early March.
- Some duck hunters in Louisiana use specially prepared skis to traverse the tricky, soft marshes of that state.
- Decoys on the market today range in price from about $1 to over $12.00 each, but some hunters claim results from the use of oil cans painted the dominant color of the species hunted.
- Electrically heated socks and gloves, heated seats and battery-powered, remote-controlled decoys are among the items that the modern-day waterfowler can add to his equipment.
- The remains of an object struck by an airliner flying at 21,000 feet was reportedly identified as a mallard duck.
- A Canada goose banded at Lake Mattamuskeet on February 5, 1938, was reportedly killed at Hudson Bay, Canada, 24 years later.
- Duck calls come in all shapes, sizes and prices to over $25.00. Most calls frighten ducks due to the inexperience of the user. But when one successful caller was offered a fancy price for his call, he turned down the offer; he called with his own vocal cords!
- The white-fronted goose and the fulvous tree duck, rare visitors to N. C. were reported bagged in the Tar Heel state last season.
- Duck stamp sales totaled 23,972 in North Carolina for the 1965-66 season.
- The wood duck made up 26 percent of the bag in North Carolina last season. The next four by bag count were: widgeon, 11.5 percent; mallard, 10.7 percent; black duck, 9.9 percent and ringneck 9.5 percent.
- Ideally, the duck blind should be positioned so that the sun and wind are at the back or at least from the sides.
- Want to conserve ducks? Then just move slightly when they start getting close!
- If the Rampart Dam project in Alaska were to go through, there would be more waterfowl breeding ground lost than has been saved by a large percentage of the wetland restoration projects for years.
- The hen mallard does practically all the calling. The drake's call is a soft, reedy, quack.
- Wood ducks nest in trees, perch on tree branches, eat acorns and have special flight abilities that enable them to maneuver through heavy timber. Is it any wonder he is called the wood duck?
- Ducks do most of their migrating at night and full moon nights are probably preferred. Flights of several hundreds of miles, non-stop are common. One report claims that the James Bay (Canada) blue goose flock flies 1700 miles to Louisiana in 60 hours, probably non-stop.
- The largest wild goose, the great Canada found in the midwest has a top weight of from 15-19 pounds. While our smallest duck, the green-winged teal weighs 12 ounces.
- North American waterfowl are hunted for almost six months out of the year between Alaska and Mexico.
- One state has a six-shell per day limit for goose hunting, on its management areas. The hunter success ratio went up immediately after the program was started. Hunters simply did not waste shells on out-of-range or marginal range geese. They waited them out.
- Ducks do occasionally get entrapped in ice and there are a number of cases on record where these entrapped birds were released by citizens or conservation officers.
- Wild rice, eaten by ducks (and with ducks) is most abundant in Minnesota. It does grow in other states including North Carolina's southeastern coast but it cannot be grown in just any pond or wet area as is often thought.

NORTH CAROLINA WILDLIFE

RESOURCE-O-GRAM

A ROUNDUP OF THE LATEST WILDLIFE NEWS

Watch for January Issue

The January issue of Wildlife in North Carolina will again be combined with the biennial report for the period ending June 30, 1966. Although the biennial report is designed primarily for use by the Governor and the General Assembly, combining it with Wildlife magazine will place it in the hands of about 110,000 subscribers to explain the accomplishments of the Wildlife Resources Commission during the biennial period. It will serve to answer tens of thousands of requests for information such as "please send me information about conserving our wildlife resources."

Second Segment of Dove Season Opens

The second part of a split dove season opens December 10 and will run through January 12. Shooting hours will again be from noon to sunset, with the daily bag and possession limits 12 and 24 birds.

Wildlife Habitat Planting Materials Should Be Ordered

February is the best time to plant shrub lespedeza and multiflora rose seedlings for wildlife habitat development. Persons wishing to obtain these seedlings free of charge should make immediate application to: Division of Game, Wildlife Resources Commission, Box 2919, Raleigh, N. C. 27602. Also available are seed mixtures containing annual wildlife foods and lespedeza seeds.

Wildlife "Board and Room" Plans Available

The Wildlife Resources Commission has available for free distribution plans for constructing bird feeders, squirrel houses, bluebird houses, and wood duck nesting boxes. In addition to supplying food and housing for the species concerned, items constructed from these plans will provide a great deal of pleasure in watching birds on the feeder and squirrels, bluebirds and wood ducks using their man-made homes. Write: Wildlife Board and Room, Box 2919, Raleigh, N. C. 27602.

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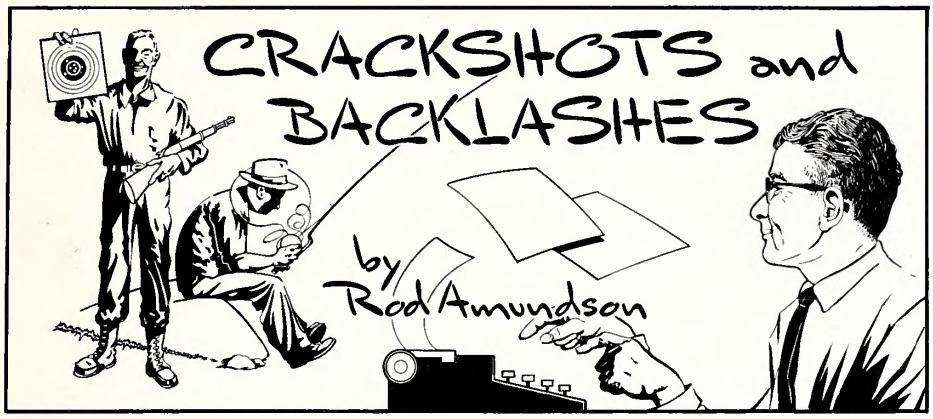
"Conservation In Action"	H. W. Bushwitz	August	6
Wildlife Habitat Development			
"R.E.A. Powerline Development"	S. Thad Cherry	January	20
"A Matter Of Choice"	Luther Partin	March	22
"Tobacco Patch Doves"	Charles Woodhouse	May	12
Wildlife Legends			
"Christmas Legends"	Mrs. H. M. Draper, Jr.	December	4
Wildlife Protection			
"It's Your Wildlife"	Marvin Plummer	November	7
Wildlife Research			
"Research"	Staff	March	14
"Wildlife Management Area Hunt Report '65-'66"	Barick, Weber, Wood	May	25
"Wildlife Dynamics"	William E. Sheldon	October	4
Wildlife & Women			
"Women, Wildlife, and The Green Stuff"	Bryant Chaplin	August	23



Last summer when the waterfowl hunting seasons were being considered by the Bureau of Sports Fisheries and Wildlife, the Bureau proposed a 23-day bonus season on black ducks in Maine, Massachusetts and New Hampshire. The Wildlife Resources Commission and the N. C. Wildlife Federation considered this bonus season unfair to waterfowl hunters in states to the south. The following correspondence is indicative of efforts made to have action on this proposal delayed until such a season could be justified by facts obtained through evaluated research.

Raleigh, North Carolina
August 29, 1966

Honorable Stewart L. Udall,
Secretary
U. S. Department of the Interior
Washington, D. C. 20240

Bureau of Sport Fisheries and Wildlife proposal for a 23-day bonus season on black ducks following regular 55-day waterfowl season in three New England states will further reduce flyway population, breeding potential, and production of a species that is already on the decline. Proposal for daily bonus bag of four black ducks during 23-day bonus season will compound damage. Nothwithstanding our requests no factual evidence has been made available that these extra shooting days and larger bag limit for Maine, Massachusetts, and New Hampshire will not be at the expense of North Carolina and other states to the south where these birds are the most important game duck. In the interest of good waterfowl management and regulations providing for a fair and equitable share of the hunting opportunity for all states we appeal to you to delay the adoption of this regulation until by study and research it can be shown: First, that black ducks migrating south through these three states during the proposed bonus season December 15-January 8 do not breed and reproduce and contribute to the maintenance of the total flyway population; and second, that cold weather does not move substantial numbers of these late migrants to southern wintering grounds where they provide shooting during the regular "no bonus" season allowed in states to the south.

We shall appreciate your consideration since this matter is of great concern to our sportsmen here.

Respectfully,
Clyde P. Patton.
Executive Director
N. C. Wildlife Resources
Commission

(Note: The following *telegram* was sent to Stewart L. Udall, Secretary of the Interior and to John S. Gottschalk, Director of the Bureau of Sports Fisheries and Wildlife on August 29th in that final decision on the migratory regulations is to be made by August 31st).

"If the Migratory Waterfowl Regulations are to properly protect our waterfowl resources, such regulations must always be adopted based on a sound factual biological basis rather than as a result of political pressures or the selfish desires of ill-informed sportsmen.

"In the case of our duck populations, the supply of which has been of increasing concern to all sportsmen in recent years, we should be over-cautious and adopt regulations only when biological studies clearly show such to be in the best interests of the conservation of these endangered species.

"We, therefore, strongly protest the granting to the three states of Maine, Massachusetts, and New Hampshire a 23-day bonus season beyond their regular shooting season of 55 days when a bonus bag of four black ducks a day will be permitted. There is no conclusive biological evidence that this extra harvest will not affect the breeding potential of this species on the entire Atlantic Flyway and that this extra kill will not be at the eventual expense of sportsmen to the south of those states.

"If our waterfowl are to be fairly managed on a sound basis we must avoid discriminatory regulations and such management must be consistent. Properly, in the past, the harvest of a part of the large North Carolina wintering population of whistling swan has been prohibited by the argument that while we have a large population here in North Carolina, this population represents the bulk of that of the total flyway and it would be discriminatory to permit such harvest in North Carolina when it could not be permitted in other states of the flyway. This year the North Carolina request for the ring-neck species to be included in the bonus bag along with the lesser scaup was denied on the biological arguments that while we had a large population in certain areas the species was not sufficiently numerous in the flyway to justify a bonus on this duck. We do not argue with these restrictive decisions, but we do object to the biological management of part of the Atlantic Flyway and the political management of other parts of the Flyway.

"I would finally point out that no wildlife conservation program will be successful without the support of the public. Recently our Board of Directors voted unanimously to support H.R. 14136 which will increase the cost of Duck Stamps from $3 to $5 because we are conservation-minded and believe that biologically this has been shown to be necessary to the program. We will continue to support a sound biological program but will be quick to scuttle a program that permits political pressures to run it. We, therefore, request that the above referred to bonus season on black ducks for certain Atlantic Flyways states be denied this season and that such be delayed until such time as there is clear, factual, concrete biological evidence that the flyway black duck breeding potential will not be affected."

Turner W. Battle
Executive Director
N. C. Wildlife Federation

Mr. Clyde Patton
Executive Director
Wildlife Resources Commission
Box 2919
Raleigh, North Carolina 27602

Dear Clyde:

Your letter of August 26 overlooks the action of the Atlantic Waterfowl Council a year ago supporting the special black duck experiment if certain preliminary bandings and other

provisions were carried out, and our agreement to proceed with the experimental season when they were. The States involved in the experiment and the Bureau have fulfilled the basic banding, and prepared for the kill survey, wing collection and other activities necessary to evaluate the experimental season. The brief discussion at the recent August Council meeting disclosed no objection to proceeding as planned. At the Advisory Committee Meeting the Council's representatives accepted the Bureau staff proposal for this year.

This special experimental black duck season has been discussed and explained numerous times in Council meetings and on other occasions. We must conclude that all Council members were thoroughly informed on the proposal, and that although some members were not in enthusiastic agreement, the Council supported the proposal as an experiment. Because it is an experiment, the necessary banding, kill surveys, wing collections, inventories and field observations are being emphasized in order that an evaluation can be made.

More than two-thirds of the black ducks banded during the winter last year and in previous years in Maine and Massachusetts were males. Banded samples may not precisely represent the actual sex ratio in the population but there is strong indication that the 50,000 black ducks wintering in this limited coastal area after December 15 have a higher proportion of males than most other wintering areas of the Flyway. No significant movement has been detectable in this wintering population after December 15. We do not believe that production from this population is likely to have any measurable effect on the rest of the Flyway.

The timing of this experimental project could have been better but biologically the proposal is sound. The Bureau agreed to cooperate on this project if certain conditions were met, and they were. We have an obligation to follow through with the experimental season. Whether this special season is repeated, even on an experimental basis, will depend on the data collected this year.

Sincerely yours,
/s/ John Gottschalk
Director

Mr. John S. Gottschalk, Director
Bureau of Sport Fisheries and Wildlife
Department of the Interior
Washington, D. C. 20240

Dear Mr. Gottschalk:

Please permit me to comment on your letter of September 14, 1966, about the special 1966-67 hunting season on black ducks in Maine, Massachusetts, and New Hampshire (subparagraph 4, page 10 of the booklet attached).

May I present some brief facts and views on this regulation and the Atlantic Waterfowl Council's consideration of it.

The subject was first proposed to the Atlantic Waterfowl Council for official action with support by New England States and by the Boston office of the U. S. Bureau of Sport Fisheries and Wildlife, at the annual August meeting in Baltimore in 1963. States to the South opposed, and on a division vote the suggestion was defeated by a majority. The 1964 meeting of the Council in Richmond likewise failed to support the proposal. This special season in New England became so important to the Honorable Endicott Peabody, Governor of Massachusetts at that time, that he solicited support for it from the Honorable Terry Sanford, Governor of North Carolina, during a trip here in 1964. Governor Peabody also corresponded with Governor Sanford and with me about it. The meeting of the Council in Newark, Delaware, on August 5-6, 1965, passed a resolution approving a special black duck season in the ". . . Northeast where substantial data has revealed the existence of an underharvested wintering population that is in fact isolated by migratory pattern from the general black duck population" (quotation from the minutes of the meeting). Of course, it is clear that the Council on this occasion approved this special season in New England conditioned on scientific research which would supply substantial data that there was in fact an "isolated," "unharvested" black duck population which did not contribute beneficially to the population of this species throughout its range. This condition has not been fulfilled by the favored states nor by the U. S. Bureau of Sport Fisheries and Wildlife. No new data on this were presented at the annual 1966 Council meeting in Roslyn, Virginia.

At that meeting the Bureau did announce and emphasize by documentary presentation that the black duck population in the Flyway continued its decline of recent years.

Under these circumstances, and with full confidence that the Bureau would keep good faith with friends in the South and would not recommend and adopt this regulation for the 1966-1967 season, we refrained from bringing the question to the floor for discussion and vote at this meeting. The Bureau's August 17, 1966, official announcement of the bonus for three New England States was unexpected and without biological justification. Also, it denied North Carolina and other opponents of the measure advance information on the Bureau's intent and the opportunity to oppose it.

Notwithstanding the position of the Atlantic Waterfowl Council and particularly North Carolina's position, we recognize that the U. S. Department of the Interior has full legal authority and responsibility for decisions on waterfowl regulations.

We feel compelled, however, to object to measures that are discriminatory, that favor one state or a group of states at the expense of others, that are adopted without an undergirding of biological facts, and that are effected without opportunity for full discussion. The "experimental" 23-day bonus season and the daily bag of 4 black ducks in Maine, Massachusetts, and New Hampshire is one of these regulations. If, for the sake of "experiment," it were necessary to kill black ducks and collect and study wings of these birds in those states between December 15, 1966, and January 8, 1967, following their earlier regular 50-day season, this could have been done by Bureau employees under controlled conditions without special privileges to certain groups, or by observing recovery of banded birds by hunters in states to the South.

In the light of scientific evidence available in our files, we will not be satisfied by the use of such nebulous descriptive phrases as "no significant movement" and no "measurable effect" used by the Bureau in describing migration and production of late migrant black ducks in the Flyway and in justifying this "bonus" regulation. The Joseph A. Hager and the C. E. Addy scientific reports on winter-banded, Northeast maritime black ducks shows that there were band returns from all states to the South as far as and including North Carolina. Robert L. Jones and Joseph A. Hager in one of their scientific papers dealing with the Northeastern maritime wintering population of black ducks state that as many as 20,000 of these birds go south of Long Island to winter.

What state and federal proponents of the regulation describe as "no significant movement" is indeed most significant to those of us to the South who hope for good shooting and who are looking to the Bureau for a fair share and equal oppor-

PHOTOS BY JOHN R. PARKER, JR.

Brody Ratchford, Jr., manager of the new Winchester Franchised Public Shooting Center, powders a clay bird (left) then gives his Missis a few pointers (right).

The South Fork Center is the first Winchester Franchised Center in the state; it is the 31st in the Nation. The Center is located in Charlotte-Gastonia area near the town of Dallas. The accompanying photographs were taken during a Press Preview on September 13. The official opening was on September 24.

The Center facilities include five fields—three skeet and two combination, interchangeable for trap or skeet. All fields are fully illuminated for night shooting. Supplementing the skeet and trap field will be a separate rifle range. A modern club house with lounge and refreshments and ample parking, round out this new family recreation facility.

tunity in the waterfowl harvest, as was intended by the Migratory Bird Treaty Act passed by the Congress of the United States.

Likewise, proponents choose to describe reproduction of late migrants "as having no measurable effect on the whole population." We know of no practical technique for isolating late migrants, following them to their breeding ground, and measuring their production and its effect on total flyway population. Certainly, all would agree that late migrant maritime black ducks and other living creatures, wherever located and whatever their habits, must reproduce themselves or become extinct after one generation. It is an indisputable biological fact that the reproductive potential of these late migrants, whatever it might be, does truly contribute beneficially to the total flyway population and to the quality of shooting from one end of the black duck range to the other. This quality is diminished in the South to the extent that a bonus season and bag allows an extra kill of these birds while they are at the northern end of the Flyway.

In the best traditions of international waterfowl conservation, as contemplated by the Migratory Bird Treaty Act, Canada has recently delayed by two weeks her 1966-1967 hunting season on black ducks in Prince Edward Island and Nova Scotia "to permit the return of a larger breeding population next spring." At the same time, with disregard for sound, fair waterfowl management and the importance of breeding stock in reversing the black duck population decline, the U. S. Department of the Interior, on recommendation of its Bureau of Sport Fisheries and Wildlife, announced that it has lengthened the season on this species in 3 states by 42 percent (23 additional days as related to a regular 55-day season). In addition it has raised the daily bag limit in these states during this period from 3 to 4, an increase of 33 1/3 percent.

We want to make a simple appeal. Please seriously reconsider this bonus black duck regulation and take action based on scientific reports and elementary biological facts concerning reproduction and migration, coupled with those long-standing, time-honored, important principles of impartiality and fair play.

Sincerely,
/s/ Clyde P. Patton

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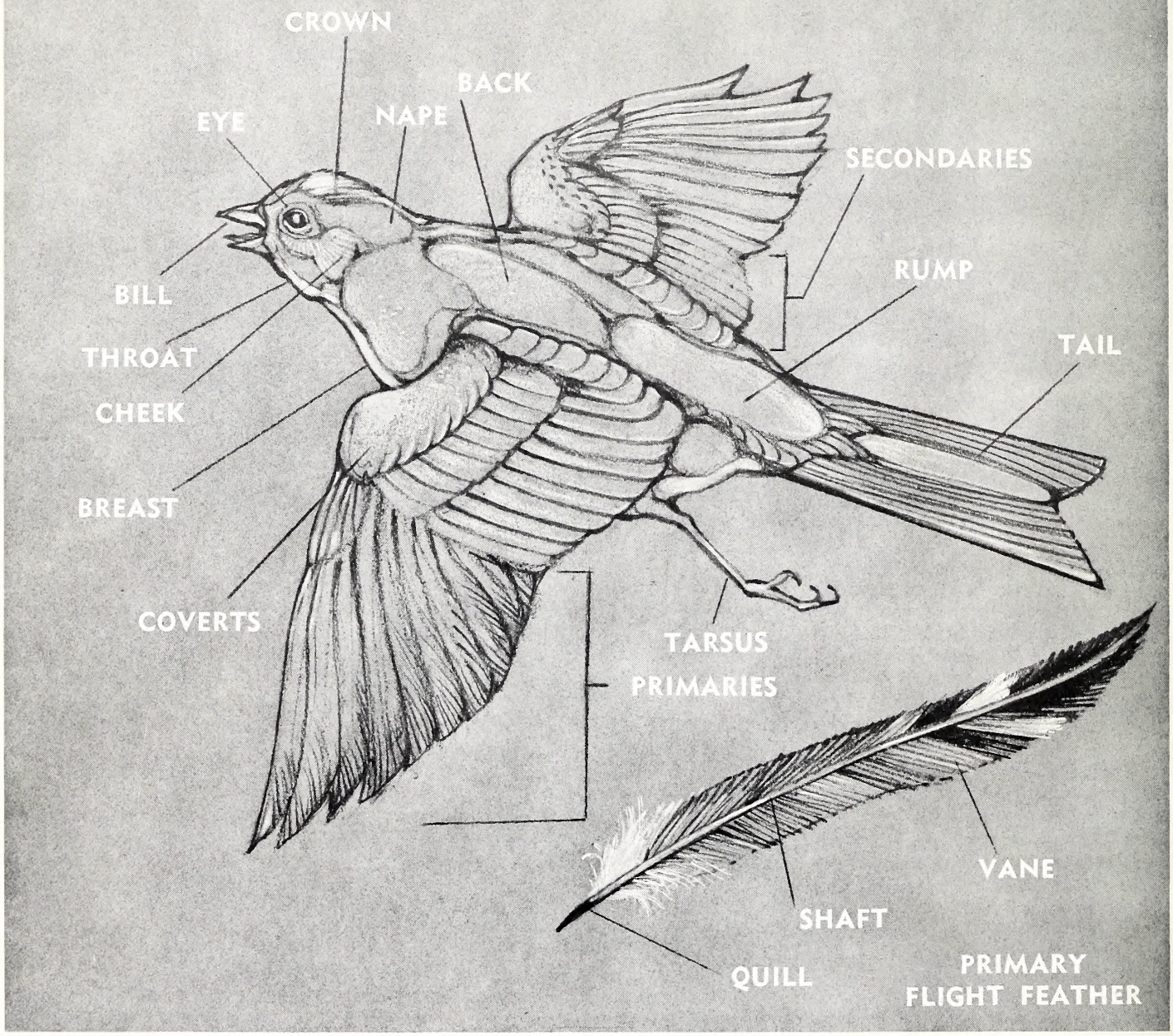
BIRD IDENTIFICATION

A Basic Aid To Knowing And Recognizing The Birds



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Birds seem even more abundant during the winter months than they do when summer is here. This is because they are more easily seen at the concentration points of bird feeders, open watering places, and in areas of shelter. We may catch only a glimpse of a bird, or be able to observe it for many minutes. In order to identify the ones that we see, we must take mental or written notes of the various parts and their colors. Written descriptions rely on a knowledge of anatomical portions of the birds. This chart will help you know them.

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